Telephony.

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Independent Telephone Men

By R. G. Shelden

JOSEPH BRUFF WARE, who is the efficient secretary of the International Independent Telephone Association, was born in southern Indiana in 1860 and removed to Michigan with his parents in 1869, and ever since has been a loyal son of the Wolverine state. He spent two years at the Michigan Agricultural College, after leaving which school he engaged in the wholesale manufacture and sale of white pine lumber and shingles, of which trade Michigan then was the center. For four years Mr. Ware was in the retail lumber business in Grand Rapids, where he organized the Michigan Retail Lumber Dealers' Association. Although he paid strict attention to his business, Mr. Ware found time to take an interest in public affairs and in 1894 he was elected to the state legislature, serving during the sessions of 1895 and 1896.

Joseph Bruff Ware.

Mr. Ware was one of the pioneers in the Independent telephone movement, and has been a prominent figure in all the advances made by the industry in his own state as well as playing an important part in national matters. He became interested in the Citizens' Telephone Company of Grand Rapids at its inception, and served as business manager of the corporation from its organization in 1895 until 1901, when he went to Detroit to take charge of the Everett-Moore telephone interests there. To Mr. Ware and his associates at that time much of the credit is due for the present advantageous position held by the Detroit Home Telephone Company in the City of the Straits.

In 1897 Mr. Ware was one of the chief leaders who organized the Michigan Independent Telephone Association at Detroit, being elected its first president. He was re-elected as the head of the Michigan organization every year until 1903, when he became associated with the Consolidated Telephone and Telegraph Company. Mr. Ware was largely instrumental in effecting a reconciliation between the two state associations in New York, and for a time acted as secretary of the organization which resulted. Mr. Ware was present at the meeting held at Detroit in 1897, when the first national Independent association was formed and took a prominent part in the work of launching the new organization and planning its successful career. He was secretary of the association during the stormy times when the Bell monopoly was pushing patent litigation against the Independents and did yeoman service in raising a defense fund and preparing for the fight which was made against the octopus.

J. B. Ware has undoubtedly been one of the most active Michigan men in the Independent industry and deserves to be ranked with the old guard who saw the business grow up to its present wonderful proportions. When the Bell made its determined effort to buy up the Michigan Independent interests in 1900 Mr. Ware did more than any other one man to thwart the plan.

In January, 1908, the International Independent Telephone Association elected Mr. Ware as its secretary. His work has been most intelligent and effective.

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Editorial Department

THE INTERNATIONAL POLICY.

IN ADDRESSES made during March before the Iowa, Ohio and Michigan conventions, President Lindemuth sets forth clearly the future policy of the International Independent Telephone Association. He reviews the work done in the past and tells what should be done in the future. In his opening paragraph he says:

"For ten years we have been building exchanges. Let us now build systems. For ten years we have been building rapidly and inadequately. Let us now build carefully and amply large. For ten years we have been building for an extensive and popular service. Let us now add to this a more careful consideration of finances and methods. For ten years we have been building too much for the present. Let us now build for the future."

President Lindenuth divides the Independent movement into three periods. He says:

"There are three stages or periods in the history of the Independent telephone movement or, rather, there have been two and we are now entering upon the third. The first period may be likened unto 'The Period of Conquest,' which represents the struggle with the Bell over the patents and which determined the right of the Independents 'to live, move and have their being' in the telephone world. Unlike most revolutionary struggles, it was along purely legal lines, wise, just, persistent and forceful; carried on by the generous and voluntary contributions of the people and crowned with boundless success. Though a period of conquest, it was not for the acquisition of new territory, but for the recovery of the rights of the people. A popular revolt against the intolerable conditions of abominable service, discourteous treatment, exorbitant rates and the ultra-conservative tendencies of an arrogant monopoly.

"The second period of Independent telephony was 'The Period of Development.' This was the formative stage during which the Independent telephone exchanges suddenly sprang up all over the country, but especially in the middle west; when scores of factories for the manufacture and sale of Independent telephone equipment, and hundreds of firms for the supply of Independent telephone accessories appeared as if by magic; until there are at the present time no less than 10,000 Independent telephone companies operating approximately 20,000 Independent telephone exchanges in the United States and Canada, with tens of thousands of miles of toll lines, occupying in whole or in part all the states and territories of the Union and of the provinces of Canada, having over 4,000,000 Independent telephones installed and being supplied by upward of 1,000 factories and supply houses and altogether representing an investment of over $350,000,000. All this has been accomplished in the short space of ten or twelve years. No such record as this has ever before been made by an enterprise in the commercial or industrial world."

The third stage of Independent development Mr. Lindemuth calls the "Period of Commercial Success and Supremacy," of which he says:

"It is true there is still some territory undeveloped, and a few of the larger cities of the land are unoccupied by Independent telephone systems. Yet, if the policies contended for by the Independents are sound, and if legitimate competition in the telephone business has proved a benefit to the people, then it is and can be only a mere question of time when all unoccupied territory, both urban and rural, will be fully developed. Its progress may be impeded for a time by unfair or unlawful means, or by an unscrupulous literary bureau, and by appeals to the alleged interests and the prejudices of the people, but the Independent policy of extensive telephone service at reasonable rates has come to stay, and, in the near future, we have all reason to expect, will prevail everywhere. In fact, if we may judge by the support which the people have given to the Independent cause, in the past, the benefits of the Independent and legitimate competition have already been recognized and approved all over the land. Our investment is already greater than that of our competitor. We are supreme in the number of our patrons. In territory where fully developed, we generally excel in the extent and quality of our construction, equipment and service, and there are no superiors anywhere in ingenuity and mechanical skill to those now enlisted in the Independent field."

With wise forethought President Lindemuth then refers to the fact that the policy of extending the Independent movement into undeveloped territory may give rise to the question of whether the competition resulting therefrom is to be beneficial. He discusses this phase of the situation in the light of what has been shown by experience. "That this competition has proved most beneficial in the past has been both demonstrated and acknowledged," he says. "What change of conditions has there been to reverse the rule?"

His answer is found in these words—and a strong answer they are:

"The best telephone minds of the country have given it most careful consideration and none is yet prepared to say that under present conditions the policy should be reversed. The only persons I have yet heard to question the advantages of legitimate competition at the present time have been employes of our competitor, and a few laymen, who, finding it necessary to use the telephones of both companies have condemned it without having given the subject a broad and careful consideration, and who, I fear, are not altogether actuated by unselfish motives."

President Lindemuth is especially convincing in his refutation of the arguments against telephone competition that it involves duplication and economic waste. He asks in what business is there not duplication and economic waste. To quote him again:

"From the railroad and telegraph companies, with their parallel lines and their duplicate machinery and organizations, to the grocery men, the ice men and the milk men, who with many unnecessary teams and drivers crisscross each other's paths daily like a spider's web, we have duplication and economic waste. Can there be greater duplication and economic waste than here? What an enormous saving to all owners would it be if all the same classes of business of the country could be combined and all duplication and waste eliminated! And yet it is not done or permitted, to the end that trade may be unrestrained and not reserved to a favored few, and to the further end that the people

may be served fairly and well, or, in other words, that the people may enjoy good service at reasonable rates and without discrimination or favoritism."

Mr. Lindemuth in no uncertain tone declares it would be ill advised to enact any legislation to force physical connection between the Independent and Bell telephone systems, and thereby destroy legitimate competition. He asserts that while such laws might prove beneficial to the companies, it would inevitably be detrimental to the telephone-using public.

In conclusion, President Lindemuth gives this sound advice to the members of the Independent association:

"Let our aim then be the planting of the Independent system in all unoccupied territory, whether city or country; the reduction of maintenance cost and depreciation charges by the best and most durable construction known to the art; the readjustment of rates along adequate but conservative lines; the adoption of the most approved business methods and a continuance of our recognized fair and courteous treatment of the public. The interests of the public and of the Independent telephone companies are one, and it is for the common good that the Independent telephone movement should be strengthened and perpetuated throughout our land."

As his first field speech since his elevation to the presidency of the International association, the address shows that Mr. Lindemuth has a firm and comprehensive grasp of his subject and is fitted to lead and advise this great organization. The International made no error in making him president, and his inaugural address—if it may be so called—shows that he will justify that selection.

EFFECT OF COMPETITION.

TELEPHONE users in Michigan have recently been furnished with striking proof that competition protects the public from exorbitant charges by a monopoly. It is "striking" proof because it strikes them in the pocket book. The Michigan (Bell) Telephone Company has been "readjusting" rates on its long distance lines, and has raised the price on lines where there is no Independent competition, while leaving all others unchanged. For instance, the rate from Lansing to Detroit has been increased from thirty-five to fifty-five cents—nearly sixty per cent—because there is no competition in that service. Between Lansing and Grand Rapids, however, the Independent Citizens' Company also has excellent toll service, and the Bell made no effort to boost the charges between those cities. In Saginaw and Jackson, where there is competition, the readjustment did not elevate rates.

There has been much complaint over the Bell's action in raising rates, and the fact sticks out like a sore thumb that the presence of a competing company has a wonderful effect in restraining a monopolistic corporation from increasing its charges. The inference is plain, and should convince the telephone public that the Bell's efforts to gobble up Independent concerns and eliminate competition constitute a policy that is inimical to their interest. Independent competition has been the salvation of the growth and development of the telephone business in the past, and always will be in the future.

AS SEEN BY A LAYMAN.

THAT the work done by Independents for the telephone users of the United States is appreciated, is shown very clearly in an address of welcome made by Edward L. Weinland, at the recent Ohio convention. Mr. Weinland represented the city of Columbus and in welcoming the telephone men to that city said:

"There is no body of men I think in the commercial world or in our every day lives, that appeals as strongly to us as the telephone men. There is no industry that appeals to us so strongly as does telephone business. There is no agency known to science or to commerce in my judgment that has done so much for this world's progress; that has brought mankind so close to mankind; that has brought the world into touch with itself so completely, as has the telephone, and there is no branch of the telephone business that is entitled to such credit as is your branch, the Independent telephone.

"Never until the Independent telephone came to this town to stay and other cities of this state and other states of the Union, never until that time did we have real telephone service. I congratulate you upon bringing to the people the use of the telephone, a use which appeals to every one of us and which appeals to every man in business, and every family, and makes all men akin and brings them all heart to heart and face to face."

Mr. Weinland was followed by the secretary of the Columbus Board of Trade, who said:

"I recall some years ago, when it was talked of establishing a competitive enterprise in this city (Columbus) to be known as the Citizens' Telephone Company, that it was said that it would be a nuisance to have two telephones on your desk; it would make the service a very much worse service and that everybody would be crying out against it in a very short time after its installation. Now I want to say to you gentlemen that the two thousand telephones that were then in use in this city prior to the establishment of the Citizens' Telephone Company has grown as if touched by some magic wand and more than twenty-two thousand telephones to-day comprise the service in this city and more and better service could not be obtained anywhere. It made the Bell service infinitely better than it ever was before, because it put them on their tiptoes, to continue in business and live, and the Citizens' Telephone Company, anxious to engraft itself into the good graces and the good will of the people by the service rendered, was also on its tiptoes from the start to the finish, and it has given to this city to-day as good telephone service as can be found in America, bar none."

These tributes to Independent telephony should make every man interested in the industry feel proud of the good work done. The American people know and appreciate the Independents, and will give them loyal support in the work of bringing the telephone into its widest usefulness.

RING OFF, MR. HANLY!

THE slang term "buttinsky" may not be the most elegant phrase in the world, but it seems happily to describe Mr. Hanly, governor of Indiana, in a role he recently assumed. Writing from his office in the Hoosier capitol, on official stationery, Governor Hanly addressed a letter to Mayor Bookwalter, of Indianapolis, proposing that the Indianapolis telephone situation be investigated by a state official with a view to bringing about a consolidation of the Central Union (Bell) Telephone Company and the Indianapolis (Independent) Telephone Company. Just why the governor should inject himself into the question is not plain, but that he is a strong advocate of a consolidation and the elimination of competition, is patent to all who read his letter. Mayor Bookwalter, while saying no harsh things about the chief executive of his state, apparently resents Governor Hanly's disposition to dip into municipal affairs. "I think," the mayor is quoted as saying, "that the city is competent to handle its own affairs."

Incidentally, the mayor declined the governor's suggestion for a state investigation. Naturally, the president of the Bell licensee thought the governor's plan to merge the two companies the very thing to do, as he promptly accepted the offer to have the state railroad commission investigate the Indianapolis situation with a view to combining the two concerns now operating, which means

wiping out of the Independent company. Of course, the Bell is in favor of any plan that will drive out competition, and any public official who urges such a proposition will be hailed by the Bell as a great man, sensible, long-headed—a veritable "Daniel come to judgment." But other people have other views. The Bell is not to find it so easy to absorb Independent telephone concerns either in Indianapolis or anywhere else.

FROM INDIANA.

IN the March issue of the Bulletin of the Indiana Independent Telephone Association appears the following creed, which is prominently displayed on the front page of the publication:

THE INDEPENDENT CREED.

I.—We believe in the right of each community to own and operate its telephone system in its own way, and are opposed to a monopolistic control of the telephone business in any form.

II.—We believe the only safety for the Independents under present conditions is to connect and co-operate with each other, and are opposed to any traffic arrangement with the monopoly which either directly or indirectly weakens the Independent system.

III.—We believe in graded, limited franchise rights, sufficiently liberal to permit fair returns upon the investment and provide for proper depreciation, and are opposed to unlimited franchises as being more to the interest of speculative greed than to the welfare of the public.

IV.—We believe in a safe and sane conduct of the telephone business in the interest of the public and the investor, and are opposed to making it either a philanthropy or a field for speculation and stock jobbing.

V.—We believe in a rate commensurate with the character and extent of the service which the public demands, and are opposed to exorbitant rates as detrimental to a developmeant of the business and unfair to the public, and too low a rate as being unfair to the telephone company and detrimental to the ultimate good of the public.

WHY NUMBERS ARE CHANGED.

OCCASIONALLY a subscriber criticises the fact that a change in his telephone number is ordered. Whenever there is opportunity of explaining to him the reasons governing such a change, however, this critical spirit vanishes. Instead of regarding it as a mere whim on the part of the company, he sees that it is compelled by economic conditions. He sees that it is costly to make such changes; he sees that failure to make them would result in greater cost, or rather in great waste of equipment; and he sees that extraordinary precautions are taken to see that there shall come to the subscriber the least possible annoyance or inconvenience.

If, for example, three subscribers to a four-party line move away from a certain section, it follows, as a matter of course, that these vacancies must be filled. If the newcomers desire a different kind of telephone service, and there seems to be no reasonable prospect of filling the vacancies from that locality, necessarily there must be a regrouping of party line subscribers, and a revision of numbers. Such a change may also be compelled by a reconstruction of the plant, by the running of new lines of cable, or by other economic conditions. Were this regrouping not made, there would be a large and indefensible investment in unused plant.

Such changes are ordered only after exhaustive studies of conditions, and the subscriber's interests are safeguarded with especial care during this transition period. The new listings are revised for prompt insertion in the current issue of the catalogue, and in addition the information operator in each exchange is supplied with complete information regarding these revised listings daily, so that casual callers for old numbers may be promptly advised and connected with the parties desired.

To make the necessary changes with the slightest possible discomfort to the subscriber is the desire of the company. To make them at all costs money, not merely for actual line work, but for these expensive protective precautions. Therefore, it is apparent that no mere whim prompts such changes; rather is it a reluctant act compelled by a proper regard for the economic administration of business.—New England Telephone Topics.

AN INTERNATIONAL ANNOUNCEMENT.

To the operating Independent telephone companies of the United States and Canada:

Gentlemen:—

The companies named below have made settlement with the association for their stamp dues for the year 1908, the same being payable monthly in advance, thus securing to your organization a regular and assured income from these companies, and thereby relieving the association and operating companies, as well as the companies named, from a considerable amount of trouble and expense incident to the plan:

American Electric Telephone Co., Chicago.
Chicago Telephone Supply Co., Elkhart, Indiana.
Century Telephone Construction Co., Buffalo, N. Y.
Monarch Telephone Manufacturing Co., Chicago.
North Electric Co., Cleveland, Ohio.
Sterling Electric Co., Lafayette, Indiana.
Stromberg-Carlson Telephone Mfg. Co., Chicago.
Swedish-American Telephone Co., Chicago.
Telephony Publishing Co., Chicago.
The Vote-Berger Co., LaCrosse, Wisconsin.

All companies whose names are not included in this list are expected to affix stamps to their invoices, as usual, and should be invited by you to co-operate with the association by so doing.

Very truly yours,
INTERNATIONAL INDEPENDENT TELEPHONE ASSOCIATION,
By A. C. Lindemuth, President.
Attest—Jos. B. Ware, Secretary.

CALIFORNIA INDEPENDENTS MEET.

THE California Independent Telephone Association held its regular quarterly meeting at the Olive street office of the Los Angeles Home Telephone and Telegraph Company Saturday, February 29. The delegates were shown through the fine building of the company and initiated into the mysteries of the new automatic equipment which had just been put into service. The general arrangement of everything and the courteous treatment of the employes were much appreciated by the visitors. After the regular routine of business F. A. Powell made his report as delegate to the International convention, which was very instructive and brought out forcibly the absolute necessity of the co-operation of the various Independent telephone companies. After the business meeting the delegates adjourned until a 6 o'clock banquet at the Bristol cafe, during which R. Holtby Myers, of Redlands, California, gave an interesting talk on telephone conditions in his district. After the banquet the manufacturers presented the visitors with tickets to the Orpheum theatre, where the evening was spent very pleasantly.

A cable dispatch from Copenhagen says that wireless telephone messages have been transmitted successfully between the Weissen Zee wireless station at Berlin and the Lyngby station near Copenhagen. The distance is about 200 miles. Professor Poulsen says he hopes to communicate with America via Ireland by telephone within a few months.

Publishers Page

SOMETHING over thirteen years ago the present publisher of TELEPHONY got out the first list of telephone companies intended for public use. It was a very fair sort of list too, thanks to the assistance given him by some of the largest concerns then catering to the telephone trade. Each year since that time he and his firm have circularized the telephone field thoroughly and availed themselves of every available sources of information to keep this list up-to-date, complete and useful. Some four or five years ago, a little advertising was inserted in this "Directory" with a view to defraying part of the expense of its publication, and it proved a great success from the advertisers' standpoint, although we have often felt since then that its rates are fixed considerably too low.

THERE are several reasons for believing that this annual "Directory of the Telephone Industry" is by long odds the best, onetime advertising opportunity in the telephone field. Chief of these are the facts that it is the only complete and reliable book of reference published in the telephone field, and that its sworn circulation of over 10,000 copies is guaranteed to cover the buyers for every operating telephone company, as well as all of the manufacturers, supply dealers, contractors and engineers throughout the United States and Canada. All of these men need such a "Directory." If the manager of an operating company wants to look up rates in other cities or other sections of the country, he gets this information from the Directory's list of operating companies. If he wants to correspond with managers in any other part of America regarding apparatus, new specialties, etc., he finds their addresses in this book. If a buyer wants to look up any article made for telephone use, TELEPHONY'S "Directory" contains the most complete list of this kind ever compiled. Under various headings also the buyers will find the addresses of the concerns manufacturing these articles, advertisers having their various classifications and the page numbers of their announcements in black face type so that the buyer is thus enabled to refer readily to the advertising section for further information.

WE ARE undertaking to make our 1908 "Directory" complete, reliable, attractive and convenient—four of the essential qualities which should be found in any successful book of reference. This year the entire telephone field was circularized five times to secure new data. We have also had co-operation from various influential sources and at this writing are able to announce a list of operating companies approximating 10,000 in number. This, we feel, will be by far the most complete list of its kind ever offered and ideal for circularizing purposes. This will be but one of many valuable features in the new "Directory"—but a most important one for all who wish to solicit trade direct. The new "Directory" also, will have each state printed at the top of the page, and each company will be preceded by symbols, indicating the kind and number of telephones the company is using. The new book's typographical appearance also will be a vast improvement over any previous "Directory" the different companies being so spaced as to make the list attractive and convenient.

The 1908 "Directory" also will be punched and strung so that it may be hung on a hook or nail at the buyer's elbow where he can refer to it constantly throughout the year.

TAKING into consideration its list of operating telephone companies, its alphabetical list of manufacturers and allied interests, its classified list of articles for telephone use, its list of telephone associations and officers and its advertising section, we believe that our 1908 "Directory of the Telephone Industry" will be found a most creditable publication and one distinctively typical of the great and successful industry for which it stands. This is but one of the many important things which TELEPHONY undertakes for the welfare of its field and the benefit of its patrons, and we believe that the telephone public generally will endorse our efforts.

WE WILL send a copy of this Directory to every organized telephone company in the United States. It will go into the mails early in April. Every subscriber to TELEPHONY is entitled to a copy with our compliments. Should any reader not receive his copy, we will appreciate his advising us promptly. We want the Directory used by every man interested in the industry, so that the widest results will obtain for all.

TELEPHONY has been receiving many expressions of approval from its readers. During the past month we have received more new subscriptions and renewals than in any previous month since the publication started. The letters and notations show the appreciation of our readers, a few of which are appended:

"Enclosed find check for renewal of subscription. To make a long story short I can't do without it."—*Oscar L. D. Brandt, Manager Northwestern Long Distance Telephone Company, Tacoma, Washington.*

"We appreciate the quality of your valuable journal, and consider it well worth the subscription price. Thanking you for your efforts in the cause of Independent telephony."—*E. G. Miller, Secretary Portage Home Telephone Company, Crisman, Indiana.*

"I saw your journal entitled TELEPHONY and like it very much, please send me a sample copy and if it is as full of good news as the one I have seen I will subscribe for it."—*J. C. Andrus, Manager Eastern Telephone Company, Robersonville, North Carolina.*

"Enclosed please find postoffice order for $1.00 for renewal of my subscription to TELEPHONY, commencing with the March issue. I think your magazine is about all right and getting better with each issue. Wishing you continued success, I remain."—*W. E. Neill, Stalley Run, West Virginia.*

"I am enclosing money order for $2.00 to pay my subscription to January 1, 1909. I have read TELEPHONY ever since it started and like it very much. So send it along, as I don't want to miss a copy as long as I work at the business."—*W. H. Fisher, Blandinsville, Illinois.*

"Enclosed find $1.00 for TELEPHONY. I like the publication very much and enjoy reading it."—*J. S. Byers, Albany, Illinois.*

IOWA TELEPHONE CONVENTION

Annual Meeting of Iowa Independents Was Held at Cedar Rapids, March 10, 11 and 12.

By John R. Hastie

THE Iowa Independent Telephone Association held its annual convention at Cedar Rapids, Ia., March 10, 11 and 12, and proved to be a great success in every particular. It was the twelfth annual meeting of the organization and was held at the Montrose Hotel, which was crowded by representative telephone men from all parts of the state during the three-day gathering. Many prominent Independents from adjoining states and representatives of all the leading manufacturing and supply houses were also present.

The preliminary session began at 2 o'clock Tuesday afternoon, March 10, with the organization and appointment of the committee on credentials. P. C. Holdoegel, president of the association, delivered his annual address, which was followed by the reports of other officers and committees, including the committee on standardization of clearing house lines and equipment, the committe on rates for clearing house lines and the state agent's report. Tuesday evening the delegates and visitors spent in inspecting the manufacturers exhibits, which were found of great interest.

Wednesday morning the convention met at 9:15, when J. M. Grimm, representing the Cedar Rapids Commercial Club, delivered an address of welcome to the visiting telephone men. The response in behalf of the association was made by J. S. Bellamy, of Knoxville. A. C. Lindemuth, president of the International Independent Telephone Association, read an interesting paper on "The Larger View," which will be found printed in full on another page of this issue of TELEPHONY.

M. O. Nicholson read a paper on "Etiquette—for Clearing House Circuits," which follows:

I have been asked to give my experience concerning what would be reasonable and polite usage or customs for clearing house lines; and from my experience, both with Independent and long distance service, the first thing that occurs to me is that operators are now compelled to accept calls and offer messages to points to which it is almost, and in many cases altogether, impossible to get satisfactory connections. From my experience I would say that no operator should be asked to attempt to put through any call beyond the second or at the very most beyond the third switching points.

The next thing that comes to my mind is the need of clearing up most of the circuits that are now being used for both through and local business. Often when we have worked our way through almost to the point we are trying to get, we lose out entirely because some intermediate switching station comes in and takes away the line, or because two way stations signal each other and connect up their parties and begin to use the line for shorter distance calls. From what I have been able to observe, these things can only be stopped by having fewer way stations on the through lines, and some way ought to be found to accommodate the through business over lines that would not be butted into so often with local business, while other operators are in the midst of putting through long distance calls.

For instance, just before I received the request to write this paper I had a call from a distant part of the state which required that I should get connections through five switching points. I worked my way along beyond the third or fourth switching point over three different routes and each time I lost out because some intermediate operator took the line away from me. This one call took one hour and five minutes of my time, and on the fourth attempt over the fourth route I finally succeeded in getting it through. But the cost in time of operators and time of circuits used was more than four times as great as should have been necessary and as would have been necessary if there had been but two switching points between the parties who did the talking.

As I look at it, there are four points to consider in this matter of "Etiquette for Clearing House Lines." One is the way operators should use each other; another is the way companies should use each other; the third is the way companies and their operators should use each other; and the last is the way the patrons should use the operators and the other patrons.

I suppose I am expected to have the most to say about the first of these four points. I believe that long distance telephone operators should be drilled just as thoroughly as telegraph operators are drilled before they should be allowed to attempt to work on clearing house lines. Probably most of the managers who attend the state convention have received the advertisements recently sent out for the "Encyclopedia of Applied Electricity" that is now being pushed by the American School of Correspondence, and in Part I of that series of volumes, sixteen pages are devoted to showing the various forms that telegraph operators must use before they can get their messages beyond their own offices. Surely the clearing house officers or some other authority should be asked to provide corresponding forms, codes of abbreviations, and other conveniences for operators working on clearing house lines.

If I was asked to suggest a form for the handling of the simplest of our telephone calls, I would offer the following: We will suppose that the operator at Cedar Rapids had a call for a number at Clinton, and has called the Clinton operator in the regular way. Instead of answering "Hello," the Clinton operator should say:

"This is Clinton."

And the Cedar Rapids operator should say:

"This is Cedar Rapids—check No. 74. Graves (or No. 783) wants W. H. Green, 1728 Main street. Messenger, if necessary, authorized by Operator Jones."

Clinton then responds:

"My check is 93. Your check 74. Graves wants W. H. Green, 1728 Main street. Messenger will be 10 cents, authorized by Jones. I will call you."

In this connection I believe it is very important that in using clearing house lines no operator should be expected to put any connection of any sort without the calling operator first offering her check number with the fullest possible information of every sort that experience shows may be needed for the handling of calls without asking any questions later, as, for instance: "Where is the party to be found?" "Will any one else do?" "Will the party calling pay messenger fee?" "If he can't talk now do you want to make an appointment later?" and all other similar contingencies which should be anticipated and guarded against by the calling operator.

I believe also that authority should be given to some committee or person to rule off of clearing house circuits all operators who either can not or will not remember to practice the time-saving schemes after they have once been agreed upon and adopted, and as they may from time to time be improved by experience, and with the approval of the proper authorities.

As before stated, I have had a number of years of experience with both the Independent and the Bell toll business and I am confident that from one-third to one-half more messages could be put over existing lines if there was a united effort made to enforce strict obedience to almost any old system; provided everybody used the same system. Managers ought to wake up and would wake up if they would operate their own circuits for one month and then figure what it would mean to add to their net earnings thirty-three and one-third per cent of their gross income; and it should be as plain as the nose on a man's face that all this gain from the economizing of the time of the operators and the circuits would be a net gain because the operators and lines cost just as much under the present conditions as they would cost with the increased efficiency, and the increased income, provided some sort of a system were once established for letting through the business that is now lost.

I will not take time to discuss the ways in which I think companies might treat each other more courteously with profit, nor the ways by which I think operators might make the treatment of the patron more profitable to their employers, except to say that I do think the companies ought to wake up to the great need of more uniformity of every sort, and that operators ought always to endeavor to imagine themselves in the place of the waiting patron and give to him whatever allowable information may be possible to keep him constantly advised of the progress of his call.

I do wish to speak, however, in closing, of the importance of

having some sort of a clearing house rule that will compel the party who calls to be always on hand to talk when the party called has been gotten to the line. There should be some sort of a general effort made to educate the users of long distance service so that they will not waste so much of their own time nor the time of the other person who is to be talked to, nor the time of the operators, nor the time of the circuits. Nowhere in the world is it more true than in the telephone business that "time is money," and surely nowhere else is more time wasted than in this wonderful time-saving business.

Volumes could be and should be written and doubtless will be written on this subject, but I must ring off because I know my overtime charge is already more than I will be willing to pay.

Other papers on the Wednesday forenoon programme were as follows:

"The Right Attitude Toward the International Telephone Association," J. C. Thorne, Fairfield; "The Strong Bearing the Burdens of the Weak," D. M. Griswold, Des Moines; "Our Faults," R. A. Walker, Des Moines; "Prevention and Defense of Damage Suits," W. S. Hart, attorney and representative of Allamakee county in the Iowa state legislature, Waukon, Ia.; "Compulsory Connections by Law—from a Lawyer's Standpoint," Judge C. B. Kennedy, president South Dakota Independent Telephone Association, Canton, S. D.

At the afternoon session Howard Herr, general manager of the Ottumwa Telephone and Electric Company, read a paper on "The Cost of City Exchange Service," which follows:

One afternoon about four o'clock I with three or four others started out in the rain and mud of an ideal Iowa March to attend a farmers' meeting in a locality known as the Soap Creek Hills. You can all imagine the amount of fire clay we had rolled up on our buggy wheels long before we had reached the Oak Ridge school house. You can also imagine the amount of fire I had in my temper after such a ride over such roads. I soon found, however, that we were not the only persons who were following the beck and call of the telephone, for the school house was crowded. After the usual organization generally necessary to meetings of this character, and the preliminary jokes from the practical joker who is always in such a crowd, they called on me to make a statement concerning our telephone connections. I tried to explain to them that there was an increased cost as well as an increased advantage to them of being connected with a company which has a large number of subscribers, and good toll connection. After I had exhausted myself I thanked the audience for their attention and sat down well pleased with my effort. I was no more than seated when a gentleman of evident rural occupation jumped up, received recognition from the chair and immediately announced that his brother-in-law and his sister kept a switchboard down at the Four Corners in an adjoining county; that he had spent three weeks with them the summer before and consequently knew all about the telephone business. "Now then," said he, "that talk that fellow put up was all right for him, but there is no such thing as its costing any more to operate a switchboard that you can answer one thousand people on than one that you can answer ten people on. All you have to do to add more telephones to a switchboard is to take a brace and bit and bore another hole in the board."

This is a crude way of stating it and I am sorry to say that a great many people are inclined to have the same opinion of the cost of telephone service. Even some of the so called well managed telephone companies do not know what is the cost of the different class of service. In fact, very few, if any, have made a definite study of cost. We have all been too busy with extensions to actually get down and figure costs. We have all gone on the supposition that if a certain rate is charged we can properly maintain and operate our plants and give a fair margin of profit to our investors. When this is done we have said everything is satisfactory, and that is all there is to be done. To actually work out the details of economic service we have not. This must and will come with the future development of the business.

As a matter of fact we must know cost in detail in order to establish adequate rates and know how to defend them. There have always been two general methods adopted by telephone companies of charging for service. Each method creates a different cost and a different standard or unit for figuring cost. One is the flat rate method and the other the measured service method. I do not believe any telephone company can absolutely say what the success of the measured service is or what the actual cost of measured service is, as no exchange has ever been wholly put on a measured service basis. Until such an exchange is operated all figures of cost for measured service must be more or less estimates, since in an exchange where measured service and flat rate methods are both employed the measured service applies to outgoing calls only. The subscribers having the flat rate can call a measured service subscriber as often as they wish without extra charge, consequently the present so called measured service does not eliminate all the foolish or unnecessary calls that would be if all subscribers were on measured basis. Measured service requires operators to do as much book keeping as operating, which necessarily leads to an expensive operating account and much friction with patrons at time of collection.

The real business of a telephone company is not to rent telephones but to receive and transmit messages, yet still with the present development of the business we are almost compelled to accept a telephone instrument for our unit of service. We might measure the cost of our service by the number of calls, but that is not the real measure.

A call may involve the use of a line one-half mile or five miles long; the conversation may last one-half minute or ten minutes; thus it becomes evident to the telephone man that some calls are much more expensive than others. If we received pay for every call that passed through the exchange, it would not eliminate the fact that the increase in number of subscribers increases the expenditures proportionately more than the increase in receipts; it would, however, come nearer to it than any system now used. As the plant grows the cost of each line increases, consequently every time a connection is put up in a large plant more invested capital has been used than in a smaller one. In a large plant quite a number of calls must be handled by more than one operator. This involves the use of expensive trunking apparatus, which must be installed and kept in repair. In a large plant operators must be supervised more closely than in small ones. The outside construction is also subjected to more wear and tear. The business office expense of the company is much larger in proportion and the loss on bad accounts is much greater. Thus everything combines to make each call more expensive, the larger the operating company.

With measured service we would not only have all the trouble and kicks that we now have, but we should add to ourselves that little instrument which causes no end of trouble for electric light, water and gas companies, the meter. Whether or not measured service measured with the call as a unit is the eventual solution of the telephone question I do not know. However, I believe it to be a step in the right direction. As conditions are now, we must continue to figure the number of telephone instruments as the unit of service.

The flat rate method was originally employed because many people were of the opinion that the business of the telephone company was to rent telephones and wire the same as the landlord rents a house, but this is in no wise true. The business of the telephone company is to receive and transmit messages. The telephone instruments, wires, switchboard and all appliances of a mechanical nature are simply to facilitate and to make it possible for telephone companies to transmit messages. Instruments are not for rent and instruments are not rented.

The cost of operating a plant is proportional to the number of calls handled through the plant and not to the number of instruments connected therewith. The number of instruments connected with a plant of necessity has a great bearing on the number of calls that must be handled through that plant. Consequently the more telephones, the more calls, and the more the cost to operate each telephone. The increase in cost, if service could be said to be by a ratio of five hundred telephones, thus is created a certain approximate increase of cost with relation to previous cost, which is applicable to an exchange of one to five hundred, five hundred to one thousand, one thousand to fifteen hundred and so on. After an exchange has several thousand 'phones installed the addition of five hundred more does not increase the cost as much in proportion as it does with the first two or three thousand, but a sufficient number of five hundred will soon be felt. The reason why I speak of five hundred is this: With a three hundred line equipment, and the present use of party lines by patrons, five hundred subscribers can easily be taken care of. The first three hundred single line equipment may be installed in three sections of switchboard. This can be handled without the aid of transfers by one, two or three operators and all calls can be terminated by the operator with whom the call originated. This service can be rendered for the lowest possible cost. Three exchanges of five hundred lines each can be operated for a much less cost per line than one exchange having fifteen hundred stations, providing there is no free service or trunking between the three exchanges. Now to add an additional section to the original equipment, transfers must at once be installed not only on the new section but on all the old ones as well. Further addition requires that for every section added there are not only the transfers on that new section but more transfers must be installed on each of the old sections. As the number of sections increases the more times must a call be handled by more than one operator, which adds complexity to the machine and slowness in service, all of which causes the expense of operation and maintenance of the plant to increase very rapidly.

When the thousand mark has been reached the plant is beyond the successful operation of the transfer system and a multiple system must be adopted. A fifteen hundred line, full multiple central energy board is installed of five sections, three positions to the section and one hundred lines to a position. This board and

apparatus will cost probably eight or ten times the amount of the original five hundred line board, but the equipment will be of a sufficient capacity to offer service to only three times the original number of patrons. By this time the outside construction has also grown very heavy, especially near the central office. And this must be rebuilt with much heavier aerial or underground construction. Either will add materially to the former cost of each line. The plant continues to grow and a new section must again be added to the fifteen hundred line board. This section will require the installation of three hundred multiple jacks in every section of the old board, besides the full eighteen hundred multiple in the new section. Thus to install three hundred additional lines on a fifteen hundred line board there will be required thirty-three hundred multiple jacks, three hundred answering jacks and signals, three operators' positions, with their equipment of keys, cords, etc., at a probable expense of seven or eight thousand dollars.

In some cities and large plants branch exchanges are physical necessities, adding greatly to installation expense and making operation and maintenance much heavier and giving rise to untold complication and trouble which has to be worked out and mastered. Branch exchanges are made necessary either from the actual size of the plant or the topography of the city in which the plant is built. Thus as the plant grows the expense of initial investment as well as operating and maintaining cost increases. This condition of the business should be reckoned with from the start.

However, it is not reasonable to say that any given plant of a given number of telephones will cost a given, definite amount to operate. On the face of it such a proposition is neither fair nor reasonable. To understand why two plants of the same size cannot be operated for the same expense we must have an idea of what constitutes the expense of operating a telephone plant, or more properly speaking what constitutes the cost of producing service. This cost can be divided into five general heads—plant investment, operation expense, maintenance expense, general expense and depreciation of the plant.

The plant investment or the initial cost of construction depends largely on the topography of the city in which the exchange is built. It is evident that in a hilly city with a scattered population which covers a large area of country it will cost more to construct a modern exchange in than in a city with straight, flat streets and closely built. In the latter the average length of line is shorter and there are fewer natural obstacles to overcome. Since modern engineering recommends that all telephone companies of any size must have their own building, the price of real estate is a material factor in plant investment. Especially is this true in large plants where more than one exchange or office is necessary. On this plant investment the investor expects and is entitled to a fair interest. If the investment is large per line, the greater must be the returns from each line in order to meet all obligations.

Operating expense is the expense necessary for the operation of the plant, including operators, trouble men, managers, wire chief and general office help, as well as light, heat and power and all things necessary for the giving and maintaining service. Operating expense will vary in plants of the same size on account of conditions peculiar to the plant itself. Some plants have a great many more calls to handle than others of the same size—that is, their subscribers are more accustomed or adapted to the use of the telephone and therefore use it more frequently. Some exchanges find they do a large proportion of the business during a comparatively few hours of the twenty-four. In such exchanges the switchboards are large and spread out, having few subscribers to a position. At such boards during the slack time more operators must remain on duty than are really needed, because a less number of operators cannot cover the board. Another very material item of variance in expense between exchanges is that of wages paid for the same class of work in different cities; also difference in cost of light, heat, power, etc.

Maintenance is so closely allied to operation and depreciation that we might say it was the middle-going account. Maintenance applies to such troubles as are in reality too large to be charged to operation and too small to be considered depreciation. For instance, if any entire lead has become slack and must be pulled, this work should be charged to maintenance, while had only one wire become slack it would have been a trouble man's job and charged to operation. On the other hand had the lead been completely rebuilt with new poles and all, the work would have been depreciation. The repair of large damage after severe storms or other causes is maintenance, not operation or depreciation. The cost of maintenance also varies in different plants and in different localities. Some places we hear of a beetle doing damage to cable, others lightning and storms of different kinds seem to be the destroying element. The chemical composition of the soil has a great bearing on the expense of maintenance. I have seen poles within one-quarter mile of each other which have been in the ground the same length of time, and one would be comparatively sound at the top of the ground while the other was rotted off. In the cities where soft coal containing a great deal of sulphur is burned a telephone plant will have a much heavier maintenance account, because the sulphur in the coal smoke attacks all exposed metal as well as injuring poles and wood work, making them brittle and brashy.

Depreciation and maintenance are so closely allied that it is hardly necessary to separate them, although in the actual accounting of a plant both accounts must be taken into consideration. A plant cannot keep the maintenance to such a high state of efficiency that there is no appreciation, neither can a sufficient fund be charged to depreciation to entirely do away with maintenance. There is a wide difference of opinion concerning what is a just per cent per annum of the original investment to charge to depreciation and maintenance. The difference in opinion is largely due to the difference in the original construction of the plant. If initial installation was made to serve only the immediate present, then operation, maintenance and particularly the depreciation account will be high. If, on the other hand, the builders of a plant built with the thought of durability and future investment, then operation, maintenance and depreciation will be much lower in proportion. Much of the operation and maintenance as well as depreciation of the telephone business is directly traceable to the initial construction. If a telephone plant is properly installed or overhauled all expense is materially reduced and service improved.

The telephone plant should be engineered and constructed along broad lines, with ample facilities for handling the business and taking care of the future growth. And it should at all times be well maintained in first class working order. Maintenance and depreciation are two accounts that are too little regarded by a telephone company in making up its items of first cost. Attention must be paid to them and sufficient allowance set aside to take care of them.

The personality of the telephone employes is a subject that should receive a most careful consideration from stockholders and directors. Good managers, practical men who know what they say and why they say; men who can meet any condition, business or mechanical, that may come up are the men who are making the dividends. The manager should, if possible, be one who has grown from the ranks and is familiar with the business, because of having worked with it on all sides and in all capacities. Such managers become a necessity and can in a year save telephone plants hundreds of dollars.

Operators who are pleasant and courteous and are at all times trying to give good service are worth much to any company. Wire chief, foremen, linemen, who have the knack of making friends among the people are also making friends of their friends for the company that employs them. The bulk of the expense of a telephone company to render service is in salaries. Don't forget that the personality to whom these salaries are paid is the make or break of your business. You can have a plant as fine as the finest from a mechanical and electrical standpoint, but if not properly manned your plant is as useless as so much junk and your material is wasted. Don't forget the boys and girls at the wheel, for they are the backbone, the life and the energy of the service you are selling. They are saving expense or making it. They are lowering cost or making it.

To furnish actual figures on cost of exchange service would require original research for which I have not had the time. It might be well for the association to appoint a committee for the purpose of ascertaining cost of exchange service in some of the different cities and towns of Iowa. Let them find the cost of service under different conditions and different environments. We must figure costs from now on. We have figured rates before. We must know cost to justify rates; costs that have been worked out with the idea of making cost less by knowing what cost really is. Such information, properly compiled and tabulated, would be of immense value to the telephone industry. Let us take a step in the right direction and learn what it is costing to give service. Contrary to what one observes with other business, with the telephone the expenses do not decrease in proportion with the increased number of subscribers, as every new subscriber requires new capital investment on which interest must be paid and on which depreciation must be written off. Further, the expenses of service are not only increased by the amount which is required for attending to new subscribers, but also with the additional cost incurred on behalf of the older subscriber with relation to the new. How large this amount will be is difficult to say. But this is certain, that by an increase in the number of subscribers the number of combinations to be made on the multiple switchboard will increase to such an extent that an increase of the service expense per subscriber must naturally result. An increase in the number of subscribers increases the number of calls and increases the original investment as well as the every day operation, maintenance and depreciation. Again let me suggest that a committee be appointed by this association for the purpose of studying the relative costs, the results to be tabulated and reported at our next annual meeting. We can no longer talk rates only as they apply to cost; if we do not know cost, how can we know or talk rates? Let us remember by knowing cost can be controlled and profits foretold.

Other papers on the Wednesday afternoon program were: "Rural Company's Experience," J. V. Blackford, president Ingham Township Mutual Telephone Company, Dumont;

"The Right Attitude of a City Company Toward a Rural Company," Stanley S. Lichty, Vinton; "The Right Attitude of a Rural Company Toward a City Company," F. R. Decker, manager Janesville Mutual Telephone Company, Janesville; "The Right Attitude of a Rural Company Toward a Long Distance Company," C. A. Plummer, Springville; "The Cost of Rural Exchange Service," H. R. Hollis, Hudson.

Wednesday evening there was a smoker, at which an interesting question box session was held. Thursday morning the convention listened to a report of the clearing house work from W. J. Thill, of Des Moines, the manager of the clearing house. Francis Dagger, provincial telephone expert of the Saskatchewan province, Canada, read an interesting paper on "International Interests or the Common Cause," which will be found printed in full on another page of this issue.

C. J. Garlow, of Columbus, Neb., president of the Nebraska Independent Telephone Association, read a paper on "What Has Been Accomplished, What Is Now Being Done, and What Remains to be Undertaken in the Missouri Valley." J. B. Ware, secretary of the International Association, spoke on "The Record Made." A. A. Moore, of Marshalltown, Iowa, read the following paper on "How We Do It":

I have been asked to write upon the subject "How We Do It." Certain suggestions and other "grape vine" information lead me to believe this means "How do you conduct an exchange and make it a financial success?"

Right in the beginning I want to say we don't do it, and in the same breath say our stockholders are probably as well satisfied as any in an Iowa telephone exchange. Twelve years ago five representative business men got together and demanded that Marshalltown be given a telephone service at the same price other towns in Iowa (where there was competition) received it? Our view was that the high cost kept down the size and that instead of 171 telephones we should have three or four hundred. Our answer was that it was impossible and that the rates in competitive towns were ruinous and would end in still higher rates. We did not believe it and established a rate at about half the price being paid and built an exchange, offering the stock to every subscriber for a telephone. Very few took advantage of the offer and the original five financed the new company and still continue to do so. It was conceived for the benefit of the town and "profits" were then and have since been a secondary consideration. Among some of the things that have contributed to our success are the following, and first, of the greatest importance, was our selection of a manager, and certainly we made no mistake in selecting W. G. Bowe.

Then we absolutely refused to fight. No matter what the competition did in the matter of rate, our schedule was maintained. We economized in all possible manners, and as an illustration, for six years our expense for office work was $15 per month—half the salary of a stenographer in the bank. No salaries were paid to secretary or president, and your writer has paid the top price for his telephone and never received a dollar except the same dividend the other stockholders have.

To-day, with nearly 2,000 telephones, our collections are made at an expense of $20 per month, being half time for a girl. You may say it is impossible, and yet on Nov. 1, 1907, we had only $319.55 three months and over old, with nearly 2,000 subscribers. Our office expense for book keeping, etc., is $55 per month. We have no fads and no idle help and no "systems," so called, except to have a good, complete record and get the money. Referring again to "systems," unless the business is of sufficient volume, the practical working of the majority of the labor saving devices saves no money the operator. I have had bookkeepers who spent so much time working all sorts of new fangled office appliances that they never had time to do any real work.

Originally we put up considerable aerial cable for a new Independent exchange, but it did not require any long practical engineering or telephone experience to demonstrate that we did not want any more, and since it has all gone underground, the only right way. We used the original "bat" of a switchboard, rebuilt and added to it with a little wire, bicycle tubing and old file until we outgrew it and then bought the best multiple board we could find, and to-day are out for a new one, when we decide whether it is to be an automatic, a wireless or an airship.

We have taken in the 468 farmers at a cost of $5 per line per month and allowed them as many telephones as they wanted to put on, averaging nineteen to line. Last year it cost us to operate an average of 1,175 telephones $14.55 per telephone, 6 per cent interest upon cost of plant, was $3.86, a total of $18.41. These figures allow for no depreciation. Last year it cost $34.35 each to install 229 new telephones.

We are growing faster than ever and face the problems all exchanges do, but feel confident an appreciative public will take care of our rate when the time comes. We have so conducted our work upon the streets and alleys with regard to the public's rights and convenience that we have never failed to get anything we asked for. As indicated in the beginning, it has not been a business financial success, because it has not paid the cost of management, but personally it has been a source of great satisfaction to make good on the proposition and to feel that the public appreciates your efforts to give them good service at a minimum cost. We have always felt our franchise a public trust and tried to administer it to the best of our ability with a due regard to the stockholder's right, never forgetting the duty we owed to the public. To the public we have always said, "We accept your franchise but are ready to return it without charge on payment of our investment." The result has been we never asked for a thing we did not get.

W. B. Burke, Burlington, general superintendent of the Mississippi Valley Telephone Company, read a paper on "River Crossings—Original and Maintenance Costs," which follows:

River crossings over navigable streams are one of the most difficult problems in line construction for telephone work. It is not only the great expense in the construction and maintenance of these crossings, but to procure the necessary permission for the erection of towers and poles at a point where it is possible to maintain does not seem to adjust itself automatically.

It is useless to consider the proposition of crossing railroad bridges, for the reason that the Western Union has contracts that control the stringing of wires over the bridges. There are but few wagon bridges where it is possible to make reasonable terms for the suspension of a cable on the bridge. When it is possible to procure permission from the bridge company, this will be the most satisfactory way of construction over rivers.

The cost of cables on bridges is somewhat higher than that of pole work, special hangers will have to be made, suitable for the bridge, and the cost of installing the messenger wire and cable will be greater than the ordinary pole line construction. The cable should be hung on Marlin hangers to prevent the vibration of the bridge crystallizing the lead sheath, which will soon produce cracks and ruin the cable. This is a very common occurrence in cables constructed in this manner, which adds greatly to the maintenance cost.

Submarine cables are often used in crossing rivers, but I have no knowledge of their success for any length of time. It is very important that the selection for these crossings should be made where the bed of the river is most suitable for submarine cable. The bed of the Mississippi river is mostly composed of sand and rock, but if it is possible to select a crossing where the bed is composed of soil it would be preferred. I have seen steel armored cable taken from the channel of the river where the steel armor and the lead sheath had been cut away by the continuous passing of the sand over the cable; many places the cable will bury itself in the sand and is free from danger of this kind. But when the ice is blocked, it gorges its way into the water, lifting the cable from the bed of the river, and often carrying it away with the ice.

The submarine cables such as used for ocean telegraph would be of little use in the telephone field. These cables are made with rubber insulation which produces a high electrostatic capacity, this being one of the objectionable features in telephone work, we will have to use the paper insulation in our cables of any great length. It is not safe to say just how long a submarine cable will last in these large rivers, but I do not think the average life would be over five years. I know of several cables that have been replaced by new ones, or aerial construction, but I know of none that has been taken from the bed of the river that could be repaired. The maintenance of a submarine cable is reconstruction in most every case. Aerial constuction is in general use, but it would not be practical to suspend a cable on a span of 2,500 feet, and we must therefore confine our aerial work to open wires.

The government requires that the wires shall not be less than seventy feet above high water mark, 200 feet on each side of the channel. In order to comply with these requirements it will be necessary to erect towers of sufficient height that the sag shall not be lower than seventy feet. In some cases it is possible to use the bluff on one side, which reduces the cost. In any case it will require from one to three towers of 125 feet in height to support the wires for river crossings. There are but few suitable locations where the span will be less than 2,500 feet. These towers will have to set above high water mark, either by concrete foundation or some point naturally high enough to be protected from overflow. It would not be possible to make this span with copper wire; the tensile strength of copper would not be sufficient to raise it above the water line. It will be necessary to adopt a special wire for this purpose of very high tensile strength.

A span of 2,500 feet with a deflection of fifty-five feet will require about forty per cent of its breaking strength to sustain it. We now have sixty per cent of its breaking strength as a margin for natural causes. We have the high winds, wet snow and sleet in

the winter months, and if we can pass the winter safely we feel as though we have been rescued from some disaster.

Now everything is lovely until the swallows come. They have their conventions, religious revivals and their political meetings on these wires. I have seen nearly every inch of these wires covered with these birds, and why they choose these long spans for their resting place I am unable to say. This does not look to be a matter of any great importance, but consider that the weight of a swallow be two ounces and allow four inches space for each one, a 2,500 foot span would have to sustain the weight of 1,250 pounds. These are some of the conditions which river crossings have to work under and you can judge that the maintenance is extremely high. The cost of these crossings will equal that of the best constructed pole line of ten to fifteen miles in length.

C. A. Laubach, of Council Bluffs, delivered an address on the subject, "A Look Ahead or the Most Important Thing to Do This Year." In the afternoon the convention finished its business and elected officers. James H. Shoemaker, of Waterloo, was elected president, and W. J. Thill, of Des Moines, was elected secretary and treasurer. The new executive committee includes J. G. Thorne, Fairfield; E. H. Martin, Webster City; H. S. Baker, Sioux City, and D. T. Griswold, Des Moines.

The visitors registered at the convention headquarters were:

Otto Wettstein, La Porte; George R. Fawkes, Waterloo; C. C. Dawson, Cedar Rapids; Wm. Markham, Clarinda; W. E. Geiger, Dyersville; Ed Worthington, St. Paul; O. S. Erland, Newhall; George Knauer, Cedar Rapids; Mrs. S. S. Lichty, Vinton; Dora Henderson, Vinton; Dr. G. A. Evenson, Finchford; W. D. Crist, Omaha, Neb.; G. A. Tilton, Collins; W. Dunning, Iowa Falls; R. C. Dodd, Baxter; W. H. Leslie, Iowa Falls; E. B. Overshiner, Chicago, Ill.; Charles L. Bick, Gladbrook; M. McFarlin, Des Moines; H. L. Cartwright, Union; H. C. Chopin, Union; F. A. Irish, Houkinton; G. W. Fitzgerald, Conrad; J. W. Griffith, Greeley; F. N. Pardee, Chicago, Ill.; William Noll, George, Iowa; F. R. McQuiston, Fairfield; M. F. Melick, West Liberty; L. C. Henss, Wayland; J. H. Weiderman, Cedar Rapids; R. C. Sayers, Fairfield; J. J. Whisler, Farragut; Ellison Orr, Waukon; W. E. Bryan, New Sharon; G. W. Gordon, Oskaloosa; O. F. Blasier, Greene; L. L. Bowlin, Hedrick; Roger Reese, Greene; Bert Zearfoss, Toledo; J. M. Mitchell, Tama; E. G. Gaskill, Corwith; F. R. Bandy, Britt; Francis Dagger, Regina, Sask., Canada; J. R. Hastie, TELEPHONY PUBLISHING COMPANY, Chicago; Homer E. Hart, Stanwood; Amos Zalesky, Lisbon; John H. Hoover, Lisbon; H. P. Lentman, Steamboat Rock; William S. Horr, Waukon; H. L. Featherstonhaugh, Cedar Rapids; C. A. Farrington, Centerville; Howard H. Herr, Ottumwa; George W. Conover, Chicago, Ill.; Joseph B. Ware, Grand Rapids; Wyatt Thompson, Keosauqua; J. A. Gustafson, Oelwein; C. A. Elliott, Oelwein; B. E. Farrand, Sumner; A. C. Lindemuth, Chicago, Ill.; Frank Zinnel, Savanna, Ill.; R. A. Lindsay, Rowley; M. E. Baum, Garrison; L. A. Haynes, Sabula; Fred J. Bollard, Rolfe; George E. Bickley, Waterloo; Floyd Jongenson, West Bend; F. E. Newberry, Clarksville; L. L. Linniger, Waterloo; J. B. Gaffney, Waverly; W. T. Goodwin, Vinton; J. M. Beatty, Vinton; J. W. Duvall, Blairstown; Charles C. Cassidy, Waterloo; C. A. Garlock, Plover; Alice G. Wykoff, Vinton; W. P. Walker, Cedar Falls; G. F. Fincknell, Alta; G. E. Gates, Downey; O. C. Steven, Highland Center; R. H. Carothers, Earlham; N. H. Wolfensperger, New Hartford; W. H. Runkle, Lisbon; A. T. Whitter, Waterloo; Paul Latzke, New York City; C. B. Kennedy, Canton, S. D.; A. L. Moreland, North Liberty; E. H. Sidwell, Iowa City; C. J. Kellogg, Shellsburg; L. L. Stoner, North Liberty; H. A. Wray, North Liberty; H. M. Traut, Madison, Wis.; J. W. Miller, Shellsburg; G. W. Harges, Shellsburg; E. M. Scott, Cedar Rapids; J. G. Mather, Palo; J. F. Van Vors, Dubuque; F. C. Bishop, Central City; W. H. Long, Dubuque; J. M. Dunn, Earlville; J. F. Snyder, Robins; J. A. Hoover, Robins; George F. Erick, Chicago; W. A. Hubbard, Waterloo; B. B. Strieby, Mechanicsville; W. J. Nichols, Traer; Miss Harriet Green, Traer; D. E. Cates, Marble Rock; Allen Cates, Marble Rock; J. G. Sanders, Houghton; B. H. Sanders, Houghton; E. C. Hesser, Iowa City; C. M. Boling, Harney; E. M. Babcock, Wyoming; O. S. Newell, Wyoming; B. J. Roberton, Lyle, Minn.; S. J. Peshak, Augustine; C. J. White, Osage; George C. Anderson, Auburnett; F. H. Peterson, Dows; C. B. Kennedy, Canton, S. D.; W. B. Burke, Burlington; J. A. Baxter, Winfield; George A. Boling, Larimer; Mrs. G. W. Fitzgerald, Conrad; F. W. Borchart, Cedar Rapids; J. C. Smith, Cedar Rapids; Joseph Tomlinton, Ely; W. W. Wolcott, Manchester; J. E. Groff, Chelsea; Frank J. Novak, Chelsea; Miss E. B. Smith, Cedar Rapids; Blanche Kroulik, Cedar Rapids; John Young, Modale; J. B. Hayes, Maquoketa; R. H. Manson, Elyria, O.; S. Ford, Covington; David Hanson, McCallsburg; E. C. Hampton, Marion; H. H. Bratt, Davenport; O. F. Fish, Colorado; George M. Schlatter, Bellevue; B. R. Dawson, Story City; B. C. Percival, Cedar Rapids; E. O. Peters, Toledo; P. H. Hallie, Moorland; D. L. McCarville, Moorland; W. R. Barkdull, Windsor, Mo.; C. G. Hawley, Clinton; L. J. Flint, Chicago, Ill.; M. H. Driftmier, Shenandoah; F. J. Dommergue, Chicago, Ill.; Levi Baker, Shenandoah; H. J. Birkestrand, Huxley; D. M. Griswold, Des Moines; Charles R. Brenton, Dallas Center; L. B. Stuart, Monmouth; H. B. Shoemaker, Toledo; L. C. Way, Carson; C. A. Laubach, Council Bluffs; Bernard C. Groh, Chicago, Ill.; W. C. Church, Des Moines; W. K. Whiteside, Schaller; J. F. Driftmier, Clarinda; Frank Brokaw, Clarinda; Ole Sanderson, Ridgeway; F. M. Ferguson, Grinnell; D. L. Woodward, Humboldt; O. M. Leich, Genoa, Ill.; J. H. Broat, Rockwell City; W. H. Fowler, Pella; E. S. Thompson, Van Horne; F. M. Boardman, Nevada; W. G. Bowe, Marshalltown; P. C. Holdoegel, Rockwell City; Charles C. Deering, Boone; J. S. Bellamy, Knoxville; J. C. Thorne, Fairfield; E. H. Martin, Webster City; George M. Bandy, Des Moines; H. A. Douglas, Cedar Rapids; E. E. England, Mt. Pleasant; H. A. Kinney, Woodbine; Dr. G. W. Graves, Spencer; O. A. Repass, Dallas Center; J. H. Shoemaker, Waterloo; Stanley S. Lichty, Vinton; C. A. Hollis, Hudson; J. M. Rider, Cedar Rapids; A. T. Averill, Cedar Rapids; J. M. Plaister, Fort Dodge; Roy Wertz, Iowa City; G. I. Saunders, Grinnell; Fred H. Crow, Oxford; Albert C. Morse, Newton; C. C. Keister, Mitchellville; J. D. Benney, Oxford; C. A. Meiswinkel, Chicago, Ill.; Luella Nash, Des Moines; David Stewart, North Liberty; C. E. Fawcett, Cedar Rapids; Fred Bishton, Cedar Rapids; H. E. Pancoast, Cedar Rapids; J. K. Alline, Chicago, Ill.; F. M. Chanders, Red Oak; L. Ross Brackney, Clemons; M. M. Head, Jefferson; George A. Bishton, Cedar Rapids; J. G. Brown, Marengo; F. C. Musson, Atlantic; Nicholas Leaven, Walker; W. B. Booker, Danbury; G. W. Weippiert, Cedar Rapids; A. J. Carter, Sioux City; J. T. Reilly, Escanaba, Mich.; Leigh H. Wallace, Washington; Frank L. Wilson, Washington; E. G. Fox, Washington; J. A. Clark, Columbus Junction; James H. Wagoner, Genoa, Ill.; E. Brintwell, Winthrop; J. H. Montague, Buffalo, N. Y.; Ernest A. Sherman, Cedar Rapids; Otto Borchert, Milwaukee, Wis.; S. N. Alexander, Lone Tree; John A. Anderson, Corning; Fred B. Switzer, Chicago; M. Fratz, Harlan; Rolland Shaver, Cedar Rapids; R. A. Walker, Des Moines; W. J. Thill, Des Moines; J. N. Bell, Stratford; Frank McNally, Carroll; W. J. Stanton, Waterloo; H. E. Mason, Chicago; O. L. Loudenslager, LeMars; J. E. Green, Brighton; D. A. Wheeler, Ireton; Edward J. Mock, Chicago; William A. Wadsworth, Chicago; L. L. Hill, Minneapolis; Fred Coulson, Kansas City, Mo.; Howard S. Baker, Sioux City; W. F. Hutton, Holstein; Will M. Traer, Vinton; L. F. Randolph, Burlington; James E. Moorehead, Ida Grove; H. S. Green, Chicago; L. K. Deal, Des Moines; G. H. Miller, Norwalk, O.; Robert Miller, Muncie, Ind.; P. C. Cockerill, Sioux City; W. R. Hind, Des Moines; A. J. Greathead,

Chicago; W. J. Crawford, Kansas City, Mo.; P. J. Eubanks, Chicago; A. J. Schoephoester, La Crosse, Wis.; Evan S. Shelby, Lafayette, Ind.; James A. Roe, Sioux City; R. L. Parker, Traer; C. E. White, West Branch; C. C. Baird, Chicago; J. M. Moore, Chicago; Charles A. Peterson, Manchester; Charles G. Cockerill, Sioux City; W. O. Rhode, Kansas City, Mo.; J. A. Duncan, Des Moines; Dow McKellor, Rock Valley; F. J. Kysela, Cleveland, O.; Max McGray, Sioux City; R. Hansen, Sioux City; Max W. Zabel, Chicago; B. H. Chase, Sioux City; A. B. Ferdinand, Chicago; George W. Rodormer, Muskegon, Mich.; Philip Zerwass, Manning; H. H. Morehouse, Chicago; Joseph R. Power, Des Moines; H. C. Downing, Fort Dodge; O. R. Johann, St. Louis; R. E. Mattison, Lincoln, Neb.; George E. Quigley, Kansas City, Mo.; J. E. O'Neill, Chicago; H. H. Bunch, Kansas City, Mo.; A. P. Eckert, New York; R. S. Mitten, Chicago; W. B. McClellan, Pocahontas; J. Owen, Rockwell City; G. E. Ross, Storm Lake; J. S. Beers, Aurelia; Samuel Walters, Hudson; G. L. Mastain, Hudson; J. Guy Haish, Vinton; C. J. Santmyer, Vinton; Will H. Guinn, Grand Junction; J. B. Terry, Cedar Rapids; W. M. Byrnes, Vail; L. A. Peterson, Elkhorn; A. D. Frederickson, Marne; F. E. Outing, Cedar Point.

The manufacturers and supply dealers who had exhibits at the convention were:

The Stromberg-Carlson Telephone Manufacturing Company, represented by W. B. Owen and F. K. Cannon, exhibited a complete line of cable, cords and telephones featuring harmonic telephones.

The Miller Anchor Company, Norwalk, O., represented by G. H. Miller, exhibited a complete line of guy anchors and augers.

The Indiana Steel and Wire Company, Muncie, Indiana, represented by Robert Miller, exhibited a complete line of telephone wire.

The Wagner Motorcycle Company, St. Paul, Minnesota, represented by E. Worthington, exhibited a 1908 model Wagner motorcycle.

The L. M. Ericsson Telephone Manufacturing Company, Buffalo, New York, represented by J. H. Montague and J. R. Power, exhibited a complete line of all steel, magneto and common battery telephones.

The Modern Electric Company, Burlington, Iowa, represented by L. F. Randolph, exhibited a complete line of telephone construction materials and supplies.

The Cracraft-Leich Electric Company, Genoa, Illinois, represented by O. M. Leich and James H. Wagoner, exhibited a complete line of telephone apparatus.

Julius Andrae & Sons Company, Milwaukee, Wisconsin, represented by Otto Borchert, exhibited a complete line of electrical supplies.

The J. B. Terry Company, Cedar Rapids, Iowa, exhibited a complete line of electrical construction material.

The Specialty Sales Company, Cedar Rapids, Iowa, represented by C. C. Dawson, exhibited a complete line of guy anchors featuring the Everstick.

The Electric Appliance Company, Chicago, Illinois, represented by R. B. Mitten and J. K. Alline, exhibited a complete line of test sets, Eaco telephones, Hargis joints and a general line of supplies.

The Illinois Electric Company, Chicago, Illinois, represented by H. H. Morehouse, J. A. Duncan and C. W. Meiswinkle, exhibited a complete line of Gray Telephone Pay Stations.

The Monarch Telephone Manufacturing Company, Chicago, Illinois, represented by W. Trimm and A. J. Carter, exhibited a complete line of telephone apparatus and a map of Iowa showing the number of Monarch telephones in use.

The American Electric Telephone Company, Chicago, Illinois, represented by Maxio Zabel and A. B. Ferdinand, exhibited a complete line of new magneto and central energy telephones.

F. B. Cook, Chicago, Illinois, represented by J. M. Moore, exhibited a complete line of cable terminal fuses.

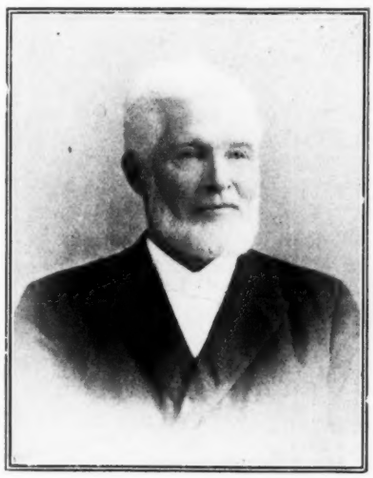
The Swedish-American Telephone Manufacturing Company, represented by F. M. Ferguson, F. Seely and E. B. Overshiner, exhibited a complete line of magneto telephones.

The Interstate Electric Manufacturing Company, Sioux City, Iowa, represented by R. Hansen and M. McGraw, exhibited a complete line of magneto and central energy telephones featuring a newly designed transmitter.

The Sterling Electric Company, Lafayette, Indiana, represented by E. S. Shelby, exhibited a complete line of telephone apparatus featuring bridging telephones.

TELEPHONE PIONEER DEAD.

DR. S. D. CUSHMAN, who is said to be the first man in the United States to hear a voice over a wire, died at Minneapolis, Minn., March 1, at the advanced age of 89. He was associated with S. F. B. Morse, the inventor of the telegraph, and it was while engaged in the construction of the first telegraph line built west of Racine, Wis., forty years ago or more, that Dr. Cushman stumbled on to the working principle of what afterward became the telephone. The party of which Cushman was a member had reached Ives Grove and the engineers laid up for the night.



Dr. S. D. Cushman.

Dr. Cushman placed his telegraph testing instrument on the prairie under a tin can and traveled seven miles down the line already built. While examining the wires he heard the croak of a frog over the line. It seemed strange to him. When he returned to his instrument he found a frog under the pan with the telegraph instrument. It flashed across his mind that he had heard that frog croak over the wires about seven miles.

He immediately experimented and discovered that the voice could be carried over a wire. This all came to light some fifteen or twenty years ago, when Dr. Cushman and the Bell Telephone people became involved in a law suit over certain telephone rights.

At the time of this discovery, it came to light that Orin White, then a pioneer of Racine, had previously been experimenting with the telephone, by means of two small tin boxes, stretched for a distance and he used to invite neighbors to talk over the line. But Mr. White never pressed his claims. Dr. Cushman lost his suit with the Bell people.

BELL TO QUIT IN CANADA.

AT THE annual meeting of the Bell Telephone Company of Canada, held in Montreal, it was announced that in all probability the company would sell out its business to the governments of the provinces of Saskatchewan and Alberta. President C. F. Sise in asking permission of the stockholders to treat with the governments stated that while he had no desire to sell under ordinary circumstances it was thought better to do so than to go into competition with the government in the telephone business. With the telephone system of Manitoba under government ownership this will practically cut the Canadian Bell company down to Ontario, Quebec and the maritime provinces.

COMPARATIVE TELEPHONE CONDITIONS

An Address Made Before the Ohio Independent Telephone Association at Columbus

By J. B. Hoge

THE telephone business in the state of Ohio has established a place for itself as one of the most important industries in the state. Over 30,000 of its citizens are directly interested as stockholders, and believe it safe to say that fully three times as many more are indirectly interested in the securities of these companies. A large number of banks and fraternal associations, as well as other organizations of the state, have purchased securities of these companies. Approximately 10,000 of our citizens are employed as a daily operating force, which does not include those employed on construction work. These companies furnish a daily service to approximately 2,300,000 people. This service would be valuable as a matter of insurance for emergencies only if nothing else, because in case of sickness or accident you are immediately placed in touch with the doctor, nurse, the ambulance, hospital, and your friends; in case of fire, if in villages or cities, the fire department can be instantly summoned, if out in the country, the assistance of neighbors and others can be secured quickly, in case of burglary, the police department, neighbors and friends can be called. The uses the telephone is put to besides emergency cases are too numerous to mention. Would you not consider getting along without some one of the following household necessities, time-piece, sewing-machine, ice-box, or washing-machine, rather than give up your telephone?

Now a few words about the business here in Ohio. Twelve years ago there were less than 30,000 telephones in the state, to-day, according to figures prepared by this association, there are 474,000. According to the federal census of 1900, there were in Ohio 4,157,000 people, in 1890, 3,672,000, a growth in ten years of thirteen per cent. If we have maintained the same ratio of increase during the past eight years we have a population of 4,595,000 to-day. If we had a telephone development of one telephone for every seven of the population, we would have 656,300 telephones, or 182,300 more than both systems are operating to-day. One to seven is not a large development for the population of this state. There are numerous cases in the state where there is one telephone for every five of the population. There are places in the United States where they have one telephone to every four of the population. The business has become so much of a necessity to our citizens as to make the success or failure of these companies of special interest to all our people.

Abuses have crept into the business, but these abuses are being remedied, and the co-operation of the various telephone interests of the state through this association can be depended upon to work out and solve these problems with the greatest economy for the companies and to the best interests of the public.

Much has been said by some of our politicians and newspapers with reference to interchange of service between the two systems here in the state. I cannot believe that they desire to bring about a consolidation. Does any one believe that the business would have been developed as well as it has been, or that the growth that is necessary to take care of the business of the future as shown by the foregoing figures, would be taken care of if only one system was in the field? Competition insures two things; first, reasonable and fair rates; second, courteous treatment on the part of the management and employes of these companies. I have presided over a number of companies, telephone, gas, and electric light, that had competition, and also over some companies that were operating a monopoly, and without exception I have found that the companies having competition gave more satisfactory service than those which had a monopoly. Also found that the public was more reasonable to deal with where there was competition in the field. It gave them an opportunity to compare the service of the two companies and they were not so unreasonable towards either company. Another very important thing that competition has done is to bring about a higher development of the art. A telephone system of ten years ago as compared with that of to-day was very crude. Examination of the records of the Patent Office of the United States will show that the large percentage of patents issued have been since the year 1894, when the original patents commenced to expire. The telephone is not yet developed to its highest state of efficiency. The telephone companies are going to be able to furnish superior service to their patrons in the future. Whether or not they will be able to furnish this at a less cost is yet to be determined. It is needless to say, however, that inventions will be more likely to be worked out to enable the companies to furnish it at a lower cost with competition than would be possible were the business handled as a monopoly.

During the past year I have been investigating conditions abroad. The city of Paris, noted for its great beauty, with 146 daily papers, with a population of approximately 2,750,000, has 48,000 telephones; the telephone district of Cleveland, with a population in round figures of 550,000, or one-fifth the population of Paris, over 50,000 telephones. A Parisian desiring to use the telephone, and the telephone is of the old magneto type, rings the bell and then goes on about his business until the operator signals back that she is ready to take his call. After giving his call he returns to his business until the operators signals back that she has the party he desires to talk with. Imagine, if you please, the telephone users of Ohio, after twelve years of competitive service, putting up with such conditions. The leading grocery house of Paris takes care of approximately 50,000 customers, daily, they have three stores served by nine telephones and receives about thirty calls daily over these telephones. One of the leading grocery houses of Cleveland, serving approximately 10,000 customers, receives more than 2,500 calls daily over the telephone systems. Are two telephone systems a nuisance in this case? Similar cases might be cited in a number of the other foreign countries. In the city of Tokio, Japan, with a population of 1,700,000, or more than ten times the size of Columbus, they have 15,000 telephones, Columbus having 22,000. The demand for telephone service in Tokio is so great that the telephone rights for a single telephone are frequently sold for a sum equal to $500 in United States money. The English government has arranged to take over the property of the National Telephone Company on January 1, 1912. They have appropriated $30,000,000 to be spent at the rate of $7,500,000 per year during the years 1908-09-10-11, in

laying a foundation upon which to build a modern telephone system when they become the possessors of the National company's property, expecting to develop it the same as they have developed the telegraph and postal systems. In Europe, with a population of 380,000,000, they have less than 2,000,000 telephones. The United States, with a population of less than one-fourth has more than three times as many telephones. When a competing franchise was granted in Cleveland there were approximately 8,000 telephones in the city, when granted in Columbus approximately 1,900, while to-day there are more than twelve times as many telephones in each city.

At the convention last year I told you about attending the hearing before the legislative committee of the state of Connecticut a couple of days prior. At that time one company had a monopoly of the business in that state. The legislature enacted laws later which make it possible to have competition. In twenty-seven Connecticut cities with a population of approximately 660,000, they had 27,000 telephones. A company has been organized with a view of furnishing competitive service in the entire state. A canvass is being made for new subscribers and they are getting an average of more than three hundred contracts signed daily. The service without competition has been poor, and the development very limited. In addition, rates in those same cities have ranged from $60 in a city where they have 908 telephones and 28,000 population, to $84 in Bridgeport where they have 3,700 subscribers and a population of 92,000. Numerous cases might be cited in this country and abroad to show that the only way to get first-class service adequate to take care of the public's demands is by having competition.

What is true in Ohio is true in a great many other states of the Union. The population of the United States according to the last Federal census was 76,200,000, 1890, 63,000,000, a growth of twenty-one per cent. If the past eight years show a corresponding increase, there are to-day 89,000,000. One telephone to seven people would require 12,700,000. There are in round figures to-day, 6,700,000 telephones, showing but little more than fifty per cent development in the United States on that basis, to say nothing about the continued growth of the country.

There were manufactured in the United States last year more than 1,350,000 sewing machines, or approximately one for every twelve families in the United States. One would naturally think that the field for the sale of these machines would soon be exhausted, and yet the manufacturing companies have been turning out a large number of machines which has been increasing from year to year for several generations. There is no question about the demand for the telephone any more than there is about the demand for sewing machines.

I have recently noticed a printed statement showing comparative earnings of a number of large transportation companies and a similar number of public-serving corporations. In each case the public-serving corporations had been affected less by the changed conditions during the past six months than the transportation companies. Of the public-serving corporations, viz., water, gas, electric light, street railways, and telephone, the water and telephone companies have been generally affected the least.

During the past two months I have had an opportunity of examining statements with reference to many telephone companies, and find in practically every case collections have been good, while a great percentage of the mercantile interests of the state are complaining of poor collections. Also find that the number of subscribers has increased and that the gross earnings likewise show an increase over the same period of last year.

Please keep the following points in mind:

(1) The telephone is a necessity and as such is affected less during financial depressions than any other business except water companies, being about on a par with them.

(2) Development prior to competition from the points of invention and extension of service was crude and limited.

(3) In the foreign companies having a monopoly the same conditions still prevail.

(4) Competition guarantees the highest grade of service, best inventive ingenuity and more extended development.

(5) Support your association, support your home company, help develop your association, and help build up a complete competitive system.

VERMONT TELEPHONE CONVENTION.

AT THE last convention of the Vermont and New Hampshire Independent Telephone Association, held at Plymouth, New Hampshire, a resolution was adopted unanimously condemning the actions of the Western Electric Company, agreeing not to use any Bell instruments themselves and threatening to disconnect their lines with any company so doing. After reciting the fight made upon it by that company and the Independents' successful development of apparatus, the resolution goes on:

"Whereas, The said Western Electric Company at the dictation of the American Telephone & Telegraph Company now offer to sell their wares outright to the Independent companies at cut rates with the object of getting a footing with said companies, so as to ultimately assist the American Telephone & Telegraph Company in disrupting the spirit of co-operation that exists between said companies through their state associations, and the International association, therefore, be it

"Resolved, That the members of the Vermont and New Hampshire Independent Telephone Association unanimously agree that they will not purchase or use, nor connect with any company that does use Bell telephones or equipment made by the Western Electric Company; that any member so doing shall be immediately expelled from the association."

The following officers were elected for 1908: President, H. W. Buchanan of Barton Landing, Vermont; vice-president, O. D. Eastman, Woodsville, New Hampshire; secretary and treasurer, Lena M. Owen, St. Johnsbury; executive committee, H. W. Buchanan, O. D. Eastman, Fred C. Gleason of Warren, New Hampshire and D. L. McGuire of Albany, Vermont.

TELEPHONES HELP THE FARMER.

PARIS papers are blaming the telephone for high prices of meat in that city, says the Zanesville (O.) Courier. They say that the farmers keep posted on the daily fluctuations of meat and fix their prices accordingly. They add the gratuitous statement that France being so much smaller territory than America the whole country is affected by the quotations in the large cities. Rural routes and telephones, however, play no small part in the transactions of the American farmers of to-day. The writer has in mind a man in central Kansas who has accumulated wealth nd who is very generous in his gifts to religious and educational institutions who has made money through his knowledge of cattle and his ability to judge the Kansas City cattle market through knowledge derived by telephone. His business is the buying of cattle which may by judicious feeding be made to take on additional weight. He buys when the market is glutted, ships the stock to his ranch and is in constant touch with the market as the cattle near prime condition. He is thus enabled to dispose of them at the highest price. This is not an exceptional case but it shows that the American farmer is becoming an adept in business as well as in raising crops.

The Inspector and The Troubleman

By A.E. Dobbs

"This young man has been with us all summer, and as he seems willing and quick to learn, I would like to have you put him on trouble until we get things straightened out."

SO READ the body of a note brought to George Wilson, the new electrician of the Independence telephone exchange, that had been started some two years before, but which, owing to carelessness and incompetence of former workmen, to say nothing of the total inexperience of the owner, had become badly run down. George had been working hard during the six weeks of his stay there to get things in shape, while to add to his troubles, Mr. Risk, the owner and manager, had, in a sudden penny-wise, pound-foolish fit of economy, laid off the men who had been working there all summer, when their services could have been utilized to good advantage under George's direction. These men leaving town almost immediately had left him without any help, and although one good man can sometimes perform, for a short time, the work of three ordinary men, very few men have the physical strength to do so continually. Mr. Wilson was no exception, and the young man with the note, who had early in the summer worked with the gang as a ground hand and later had been allowed to climb when the gang was in a rush, was sent to him as the result of a vigorous call for help.

It required but a glance at the red-headed, freckle-faced, young fellow standing before him to see that he was no lineman.

"How long have you worked at the business?"

"Since last May."

"How long have you been climbing?"

"I climbed almost every day for the last two months."

"Did you ever do anything but carry a wire up a pole and tie it in?"

"No, sir."

"Let me see your tools."

The young man produced a pair of new climbers and a belt with pliers and connectors attached.

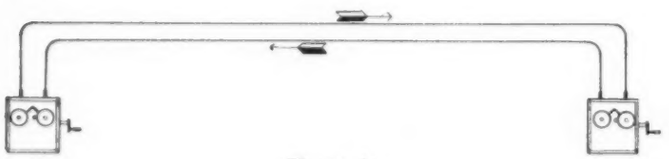


Figure 1.

"All right. Do you know what a cross is?"

"Why, yes. It is when the wires get mixed up together."

"Well, that is the correct idea, though it is not the way a lineman would say it. Let me see—this note does not give your name."

"William Harrison Butler, generally called Will for short."

"Very well, Will. The wind played havoc and shook in a large number of crosses last night, and as the simplest way is the quickest, you may take the D.-Street line, while I will follow out Pine Alley. Shake out all the crosses you see, and when you get out to J. Brothers' factory, you may call up '900,' which is the manager's number, and ask for further instructions. Be as lively as you can, for we have a lot of trouble in to-day, and we want to get out as much of it as we can before the subscribers find it out, for if a man fails to get one call over a telephone wire, he gets mad and tells his neighbors all about it, which we don't want him to do; all of which goes to show that the telephone is an invaluable aid to modern business, and that they miss it badly when they don't have it."

Will started out very proud of the fact that, at last, he

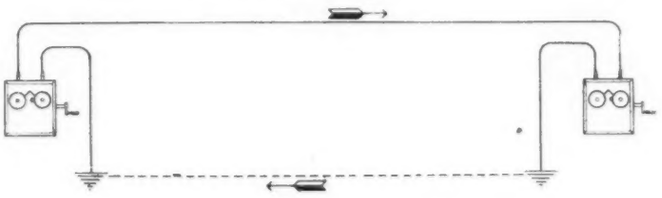


Figure 2.

could be trusted to go out alone and do his work without someone to show him how at every step. He found quite a number of wires crossed on his way up, but by dint of active hustling he got up to J. Brothers' factory in about an hour's time. Here another difficulty confronted him; in all his life he had never used a telephone, and had not the remotest idea of how to call "900."

But a young fellow with a red head and a quick wit will not be caught as long as his brain holds out. Walking into the office with an air of deference and modesty which did not belong to him, he said, addressing the head of the firm: "Mr. J., your telephone line was crossed up to a little while ago, and would like to have you call '900,' and see if it is all right. Of course I could do this, but I know you will be better satisfied to do it yourself, for then you'll know it is all right."

Mr. J. was perhaps surprised at a telephone man's making such a request, but he readily complied, Will Butler meanwhile watching every move with the keenest attention. The line was all right, and Mr. J. told Will that he was wanted at the telephone.

How many remember the unnamed feeling that comes over one the first time he uses a telephone; the queer sensation of delight and triumph that is almost childish and of which he feels ashamed, coupled perhaps with just a suggestion of fear as the words reach him from the distant station, and his strange wonder as he realizes that his own hesitating answers are heard and understood at the other end of the line, and that he is now fairly in touch with twentieth century civilization? Those of us who use a telephone many times a day, and swear every time we have to wait ten seconds for an answer, do not realize what a wonderful performance we are taking part in, one which is more wonderful to the scientist who understands the complex nature of sound waves and electrical impulses than to anyone else, and to whom the questions when first considered seemed almost impossible of accomplishment. Here the sounds, first translated into electrical vibrations,

go whirling, vibrating, dancing over a wire that opposes their passage, meeting stronger currents that are coming to meet them, while others cross their path, and still others try, by going the same way, to crowd them off. Still they go on, dodging some, traveling arm in arm, as it were, with some, and riding over, or through others like a strong swimmer in the surf to reappear again as sound waves in their original shape. No wonder the mathematician finds it difficult of explanation and gets lost in a maze of symbols.

Young Butler, however, did not know much about this, and he had not long to consider it, for the manager reported all the lines on that lead "clear," and sent him half a mile away to clear a "grounded" line.

Now, what is a ground? Will had often heard the linemen talking about "grounds," but he had never learned

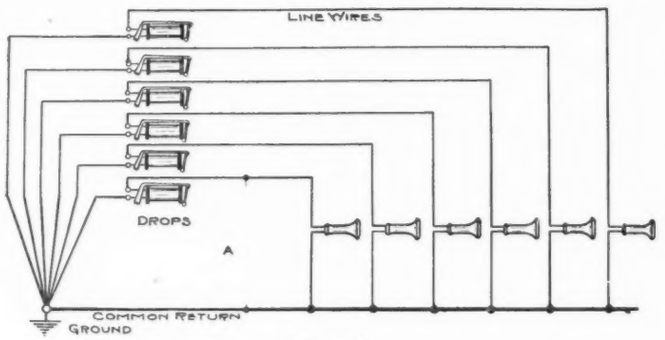


Figure 3.

just what they were, and now he was in a quandary.

Going over to the subscriber's place of business, he found that he could raise "Central," and though the conversation was not perfect, he was still able to make himself understood, and he went out wondering more than ever just what was the matter with the line. He followed the line back to the office, but could not see it lying on the ground anywhere, and was no wiser than when he started out, but just then he met George coming in also.

"Say, what kind of a looking thing is a ground?" said Will, thinking it better perhaps to confess his ignorance than to be accused of killing time.

"A ground," said George, "is a connection with the earth, either by actual contact with the ground, which is the case when a wire is broken, or, what more commonly happens, it touches another grounded line or the iron framework of a building, or it may be crossed with its own return wire.

"Every electrical circuit must be returned to the place from which it started, either by means of two wires (Figure 1) or by one wire to its destination and returned through the earth which simply serves as a conductor and takes the place of a second wire (Figure 2). Sometimes several lines are combined in one common wire which acts as a common return for all of them. This is done where there is leakage from the grounded feeders of the average trolley road which makes grounded lines scattered over a large area impracticable.

"In this office we have a common-return system, that is, each wire is connected to its telephone, then passes out of the other post and the current is returned, by way of the drops, on a wire common to all of them." George drew a sketch (Figure 3) showing how the telephones were connected to the return wire in this system. "In addition to this, for various reasons which we need not discuss now, this return wire is grounded, and though this grounding is not necessary to a common wire system; as it is you see that if a line wire was to come in contact with the earth it would be the same as though it was crossed with the return wire, which, of course, will prevent current from reaching the instrument.

"But I was able to talk from this place and ring Central," said Will.

"Well, that proves that your ground it not a very 'heavy' one," said George, "as otherwise it would have cut you out completely. Of course, if the resistance of your ground is equal to, or more than equal to the rest of your line, it follows that the current will divide and go both ways." Here George made another pencil sketch (Figure 4) showing a circuit grounded with a resistance of 150 ohms (a), while that of the farther end of the line was only 100 ohms. "Now you see it follows that the end of the line will get more current than the ground, and if the line is in otherwise good condition, conversation can still be carried on over it, but if the ground connection should be as low as 10 ohms, the telephone would then only get one-tenth of the current, which would most effectually cut off conversation."

"Will any kind of metal in contact with the wire ground it?" asked Will.

"No," said George, "not unless the metal itself is in contact with the earth. Thus a wire may sometimes touch a tin roof, and yet not show a ground to the ordinary ringing current, because the tin does not come in contact with anything but wood and brick, which are fairly good insulators, at least when dry, but, if the roof should be connected with the plumbing of the building, through closet pipes, etc., it would then be grounded, because these pipes are connected with the sewer and water main systems of the city, and, of course, are in this way connected to earth.

"And also remember, if you have to connect the instrument to earth—for in some places they do this instead of using a return wire—connect to water or gas pipes if possible, for then you have many hundreds of feet of earth contact, but more important still, the current follows the pipe right back to the office through very little resistance. A water pipe is, however, better than a gas pipe, as they use red lead or sealing wax on gas pipe joints, which sometimes makes their resistance high; besides, there is always the possibility that the gas meter may be disconnected, and unless a wire is jumpered around it, or it touches a water or drain pipe in the building, the circuit will be open. Therefore, if you must connect a ground wire to a gas pipe put it outside of the meter, or, at least, put a jumper wire around the meter."

Just then they saw the wire lying against a guy wire, which in turn was touching a water conductor from a building, and which was in turn connected through a cast-iron drain pipe to the ground.

"There is your trouble," said George, who noted all these points at a glance. "The wire, you will notice, has slipped

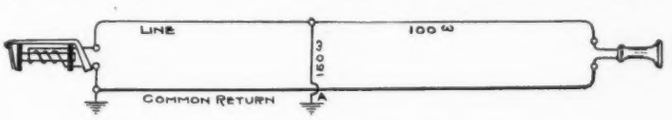


Figure 4.

off the top of the glass insulator, and if you tie it back in place it will be all right."

Will did as he was told, and in a few minutes was on the ground beside George, who had watched his work.

"Now," said George, "we will go into the subscriber's place and make a test, for there may be other grounds on the line."

Entering the store, George proceeded to take one wire out of the binding post of the instrument with his screwdriver. When he had done so he held the wire against the post while he called Central, and asked her to ring, and at the first tinkle of the bell held the wire away.

"Did the buzzer ring?" asked George of the girl.

"No," said the girl, "it did not ring at all."

"All right," so saying he put the wire back under the binding screw.

"The line tests open," said George, "which shows there

was no ground on the line when I had it open, so we know it is all clear. Had there been a ground, it would have rung the office buzzer. I may as well tell you also that some switchboards are so constructed that the girl, by inserting a long, or a short plug, as the case may be, can also open the line so that you can ring and make this test yourself and don't have to open it at the instrument, but I will tell you about these some other time."

Will was kept so busy shaking out crosses and repairing wires during the next two or three days that he had little time for anything else, till one day, having been looking for a cross he could not find, he appealed to George to help him out.

"Let us first locate this thing," said that individual, who had meanwhile been busy renewing batteries and rewiring some old-style instruments. Going up to a wall set behind the board, he connected one wire to the common return, and removing a clip from the fuse block, inserted the other wire in the end next the board. A turn of the crank raised the operator, which showed that the trouble was not in the office cable. Placing the wire now on the other side of the clip, he tried the line end, and while the bell rang good and strong no one responded except the operator, who came in on the other wire. Taking down the receiver, he blew softly across the mouthpiece of the transmitter.

"That trouble is near by," he said.

Counting down to the cable number to which the line was attached, he told Will to go outside and open that wire in the cable box.

When Will reported from the pole outside that he had done so, George rang up and got a closed circuit as before.

Looking over the cable terminals, he found a vacant one, which upon testing out he found open. Changing the cross-connecting wire from the faulty one down to the new conductor, he directed Will to make a like change outside.

When this had been done he tested again, and this time found the line all right. He now directed Will to take the binding screw out of the post just vacated and leave it on a shelf on top of the box, and in order that that post might not be used again, George on the inside made a cross with a pencil opposite the faulty one.

"Say," said Will, when he came in, "don't we have to change both of those wires? You know two lines were crossed."

"No," said George, "because as the two conductors are crossed together and do not show a cross with anything else, we, by using only one wire, make one conductor of the two, which does no harm."

"I noticed that you blew across the transmitter when you were making a test; how could you tell in that way where to look for your trouble?"

"Well," said George, "that takes a great deal of practice, and besides you must know your lines, that is, you must be able to distinguish between static and trolley induction.

"Now, listen," and George handed Will the receiver, short-circuited the instrument and blew across the transmitter mouthpiece, telling him to notice how clearly the disturbances on the diaphragm came back to his ears. Then changing to a long-line connection, he told him to observe the difference in sound.

For the next few days Will practiced this method at every opportunity until he became nearly as expert at it as George. He also found that he could almost tell the distance to a break in an open line by the same method.

When he related this to George, thinking he had made a discovery, that individual merely remarked that it was only the old static method of locating breaks in cables or telegraph lines, the only difference being that a telephone is more sensitive than a galvanometer. This, of course, was all Greek to Will, but as George seemed a little grouchy that day, he forebore asking for further information till he was in better humor. But one morning when the latter was unusually cheerful and work was not pressing, he took pains to approach him on the subject and asked what he meant by the static charge.

"Did you ever get a shock from the wires when you were working in the country?" asked George.

"Yes, lots of them," said Will; "why sometimes when I was tying in I used to get very sharp shocks, but I always thought someone was trying to ring up on the line, or that we had crossed a telegraph wire, and more than once I got them by touching the bottom of the glass, and sometimes they came so hard that the men on the ground were almost knocked down by them."

"Well," said George, "that was one form of static charge, and the lines were not connected in, or you would not have felt it, but instead it would have gone through the telephone and a person listening on the line would have heard a crackling sound. Now, this induction is from the air, and is always opposed to the telephone current, and it is not easy to insulate. Now, that is the charge which makes the disturbance on an open line, and to a certain extent on a closed one, but there is also another form that is rather harder to explain. When you make a sound wave in air you cannot hear it as sound till it has set the air in motion. But setting the air in motion involves work, that is, it must move the air around it from a condition of rest or quiet to a rapid wave motion which of course means loss of energy, so much so, that even thunder can only be heard a comparatively short distance.

"By the way, did you ever make any transpositions?"

"No, Lon Williams and Bailey did nearly all of that."

"Well, two of our toll lines are rather too noisy, and as we have not much to do to-day, we will get a team and drive out over them, and see if we cannot take out the noise. I will go around and see about the team while you get out the stuff. Take along about twenty of those double groove insulators, and about the same number of the ordinary kind, some pins, for we may find some broken, also the double blocks, and two 'come-alongs,' 'grips' or 'eccentrics,' as they are variously called, a hand ax and plenty of wire. And don't forget to take along a telephone and your regular lineman's tools."

George went in to speak to the manager in regard to his trip, and to notify a livery stable to get out a team, as the manager's horse and buggy were away at the time. When he returned with the team he thought he might as well be prepared for a general inspection trip, so he added two receivers and two or three pounds of sal ammoniac to the material already in the buggy.

"Now," said George, when they were fairly on the road, "we will drive over this line and make notes of its condition and inspect the instruments, then what work needs to be done we will do coming back. You may, however, put on your climbers, so that if we see any broken glass we will lose no time."

The trip out was a pleasant one, and devoid of anything more exciting than the replacing of two or three broken insulators. Will knew the line fairly well, having worked with the gang on this section for a short time, but George had never been over it before, and made a note of everything he saw. Part of the way the line ran parallel to a trolley road for about a mile and a half, and in one place both the trolley feeder and the telephone wire passed through the same tree, and the limbs had chafed through the insulation on the feeder, while other limbs were brushing against the telephone wire.

"I should think the railroad people would keep their lines clear," muttered George, "that infernal limb will shunt enough current in the course of a year to run a car, besides making trouble for us. Go up and take that limb off. No, first clear the telephone line, and then clear the trolley feeder."

Will cut and broke limbs under George's direction until

not a leaf remained near the telephone wires, the man on the ground removing them, twigs and all, to an obscure fence corner as fast as they fell.

"Now," said George, "remove that limb against the feeder, for that limb electrifies the whole tree and makes it bad for us. The trolley company will give us no credit for it, but we want it out of there on our own account. Cut that limb close to the tree and make a neat job of it. No, not that way. Cut it on the under side first, so that when it breaks it will not split out. Now, then, cut it on top."

"Here! Gol darn your pictures! Who in blazes told you you could cut that tree?"

Will had made two cuts on the upper side of the limb, and now paused with his hatchet in the air as if paralyzed, while George, who had half expected something of this kind, turned toward the newcomer, prepared to parley.

"Do you own this tree?" he asked calmly.

"Yes, I own this tree. Who told you to cut it?"

"Then I was misinformed, for a man I just met told me that this farm was owned by a man living in Detroit."

"Well, he's a dod-rotted liar. This farm is owned by me, and I want to know if your infernal corporation thinks they own the farms along here as well as the highway?"

"No," said George, "I well know that you farmers own the land to the middle of the road, but I was misinformed or I should have asked you. Now, will you tell me whether the little trimming we propose to do here will injure that tree in any way? We obtained the right of way along this road from the majority of the property owners, with tree-trimming privileges, and, supposing that it was all settled, we were simply trying to put our lines in better condition."

"Well, you never got any permission from me, and if you cut another limb I will have the law on you, and don't you forget it."

"Will you let us finish the limb we are at?"

"Not a dog-gone finish. Don't you cut another lick."

"Come down, Will," said George, seeing that further argument was useless.

"I am sorry that we made a mistake," said he, turning to the farmer, "and it shall not happen again."

"Well, see that it don't."

Getting into the buggy, they drove away, and when out of hearing Will remarked: "What a splendid bluffer you are."

"Well, I have been in this business for several years. In most cases I make it a point to get permission for this kind of work, but something told me we would get a great deal more by not asking."

"It is a pity I could not finish that limb."

"Well, the limb will die and drop off eventually, as it is half cut off anyway, and some day when we are passing along here we can throw a rope over it and assist nature in making away with it if the trolley people don't do it for us. Anyhow, our lines are clear, and that limb can't shunt as much current as it did."

"Won't the trolley current kill that tree in time?" asked Will.

"Do you see any signs of that tree dying?"

"No."

"That trolley road has been there about three years, hasn't it? Well, that is your answer; you see the tree is still vigorous and healthy.

"Electric power wires rarely kill trees unless there is leakage enough to burn the tree, which is not often the case. In some cases where wires are run through trees the limbs are carelessly cut and broken till the tree is killed in that way, and in many cases it is laid to telephone wires, which never carry any current except when in actual use, and then only a very feeble one. And a power feeder against a single limb never killed a tree yet, though I have known it to clear itself by burning the limb half in two and kill the limb in that way."

"Now," said George, when they reached the point where the two lines separated, "there are only two transpositions of the line alongside this trolley road. When we get back here we will put in about six and see if that does not help matters."

"How do transpositions help matters?"

"First, by shifting sides to the trolley induction, so that both sides get an equal share of it, for if one side gets more than the other the line is thrown out of balance and becomes noisy, and the side next to the disturbing cause, the feeder in this case, always gets the most, but by constantly turning first one side and then the other both get an equal share, like a spitted chicken over a fireplace."

As George seemed to think this last remark funny, Will laughed, which put them both in good humor.

"Then again," continued George, "I told you something about the static induction; now, by turning the different sides toward the feeder we get a current that opposes the static charge. See?"

Will thought he did, and they arrived at their destination, eighteen miles from their starting point, before dinner. They had passed two toll stations on the way, at each of which they renewed the batteries, though they were in fairly good condition, but George thought it easier to fix them up then than to make a special trip over the road for that purpose.

He also found that some of the carbon blocks in the lightning arresters had accumulated considerable dust, which had been caused by lightning flashing between them, and which, in one place at least, must have grounded one side of the circuit.

At each place he had tested the line back to the office, always opening it from the farther side, in order to listen on the line for induction effects, so that he could tell where transpositions were most needed. In one town the line ran close by a lot of electric light and telegraph wires in such a way that much of the noise at night was easily accounted for. He made four transpositions here, which, by testing the line with the instruments he had brought along, much improved the service. On the way back, as it was getting rather late, he put on a pair of climbers himself and helped Will to get the transpositions done, for he could easily work twice as fast as the young man, who was yet rather awkward, so that they made quite rapid progress, but in spite of all they could do it was long after dark before they returned to Independence, tired but thoroughly satisfied with their day's work, for they had trimmed trees, put on glass, inspected instruments, and cut in ten transpositions, besides driving over eighteen miles and back.

When the manager tested the line that night it was so quiet he could hardly believe his own ears.

The continuation of this series of articles will be found in the May TELEPHONY.

GROWTH OF OHIO INDEPENDENTS.

FRANK L. BEAM, president of the Ohio Independent Telephone Association, recently completed the compilation of a statement of the Independent telephone companies of Ohio, which shows that the companies have had a great growth in the last year. The statement shows that every county in the state, with the exception of Hamilton and Marion, has one or more Independent telephone companies.

Cuyahoga county leads with 28,875 telephones, while Franklin is second, with 13,298, and Lucas third with 13,014. There are 879 Independent exchanges in the state with 1,895 toll stations, 307,675 telephones, and 25,458 stockholders. Showing the growth of the Independents in Ohio, it may be stated that March 30, 1905, there were 668 exchanges, 1,452 toll stations, 196,637 telephones and 17,029 Independent stockholders in Ohio.

Digest of Telephone Literature
Conducted by E.M.Rothelle

[This digest includes the telephone articles printed in technical and scientific publications in all civilized countries. It is a complete index to the world's telephone literature. All publications are given numbers. The title appears first followed by author's name, number and date of publication; for example: 122-1-25-08 is Electrical Review of date January 25, 1908. Those desiring any article in this digest should address the publication whose key number is given below. The publications reviewed in this issue follow.—Editor.]

104—Western Electrician, Chicago.
111—Western Telephone Journal, Vinton, Iowa.
115—Electric Club Journal, Pittsburg, Pa.
121—American Telephone Journal, New York.
125—Electrical World, New York.
131—Southern Electrician, Charlotte, S. C.
133—The Transmitter, Weatherford, Texas.
134—Telephone Age, Toronto, Canada.
141—National Telephone Journal, London, England.
142—Electrician, London, England.
143—Electrical Engineering, London, England.
146—Electrical Review, London, England.
161—Schwachstromtechnik, Munchen, Germany.
171—Royal Telegraph Bureau Report, Stockholm, Sweden.

The Recovery of Selenium Cells, After Exposure to Light. E. Merritt. 142—2-21-08. It is of interest to telephone workers to understand that selenium does not respond instantaneously to illumination and that the recovery is often less rapid. The present discussion refers to a paper read by the author before the American Physical Society.

The Transmission Line Considered as a Mechanical Structure. W. T. Ryan. 125—2-29-08. We have had a number of inquiries regarding the calculation of stresses in connection with wires, cables, and poles. The subject is of an interesting character and the present article covers the question in a fairly thorough manner. Any one interested in this subject might read the article with profit.

Why Wooden Poles Break Above Ground. C. B. Smith. 125—2-29-08. After referring to the usual observation that tall wooden poles—say, forty feet or over in length—generally break off some distance from the ground, Mr. Smith submits the results of an investigation which shows that poles of a uniform taper and free from knots are the weakest at a certain distance from the top, this distance being independent of the pole length, it being found that wood is weakest where the fiber stress is greatest; and it is therefore only necessary to locate the maximum fiber stress to determine the probable point where a pole will break off under a severe strain. Taking as an example, an Idaho cedar pole having a top diameter of eight inches and an average taper of .01 per inch, it is found that the pole will break 33 feet 4 inches from the top no matter how long the pole may be, provided it has a length equal to the above distance; a shorter pole breaking off close to the ground.

The Protection of Electric Circuits and Apparatus From Lightning and Similar Disturbances. R. P. Jackson. 115—3-1-08. In the present installment the general protection of electrical circuits and apparatus is discussed chiefly from the standpoint of its application to electric light and power circuits. The article should be of interest to telephone workers.

Protective Relays. M. C. Rypinski. 115—3-1-08. In the present installment alternating current and overload relays, both single and polyphase, are discussed, with particular reference to the instantaneous action of relays, and concluding with the discussion of the definite time element action of a particular type of relay, the range of adjustment being from one to five seconds.

Magneto Telephone Design. W. A. Taylor. 134—3-1-08. A continuation of Mr. Taylor's elementary articles. Switchboard circuits and designs are presented in the present installment. Mr. Taylor describes different drop connections, ringing and listening key connections and the cord circuit details.

The Propagation of Telephonic Currents Through Underground Conductors. H. Abraham and Devaux-Charbonnel. 142—2-28-08. European investigations in the transmission of telephonic currents have been of considerable interest during the past year or so. In the present article the authors work with alternating currents whose frequencies were from 250 to 500. The voltage was somewhat less than one volt and the tests were made over paper insulated cables and the measurements were made both at the receiving and transmitting ends of the lines as well as at some of the intermediate points. A general summary of the results is given in the article.

The Most Efficient Working Conditions for Telephonic Apparatus. 142—2-28-08. This paper is along the lines of investigating the question of whether the manufacturers of telephone apparatus are choosing the correct dimensions of induction coil windings, resistance of receiver coils, etc. In discussing the telephone receiver, it is stated that for a given inductance of receiver coils, the diameter of the wires should be such that the resistance of the receiver is slightly more than one-quarter of the apparent ohmic resistance of the line, including in this assumption the wire upon the secondary of the induction coil. This rule, with a line of about 500 ohm resistance, necessitates receivers having a resistance of between 100 and 200 ohms. Under ratio of transformation, where R is the apparent ohmic resistance of the line and M the internal resistance of the microphone, the most favorable value of the ratio of transformation is slightly greater than the $(2\text{-}2N)^2$, which works out between six and seven. Under transformer winding—in order to obtain the greatest efficiency, the impedance of the secondary winding should be considerable greater than the apparent resistance of the line. In testing different specimens of induction coils by measuring the amplitude and phase of the currents and the primary and secondary E. M. F's., the efficiency was found to be less than sixty in all equipments examined, which appears to indicate that telephone transformers in general are too small, nothing being more easy than obtaining transformers whose efficiency is ninety per cent. The authors, however, give warning not to attach too much importance in this matter of induction coil construction, for the ear is so little affected by variation in the intensity of sounds that the hearing seems but little improved. The short article concludes with the suggestion that inventors should concentrate their efforts on the microphone as this instrument is capable of great improvements.

The New East Ham Telephone Exchange, London, England. J. W. O. Sandell. 143—3-5-08. A general description of the telephone building and a 7-position common battery switchboard is presented. Circuit diagrams show the line circuit and cord circuit connections. The

board has an immediate capacity for 400 subscribers' lines, with space for an ultimate capacity of 800. The calls are answered by plugging direct in the multiple, no answering jacks being provided in the board. The line signal is of the target type. The cord supervision is also of the target type, and arranged with relays for supplying current to the subscribers' lines. The cord circuit is of the regular impedance transmission type. The wire chief's test panel is illustrated. It is observed that the voltage of the exchange is something over thirty-two.

The Measurement of Telephonic Speech Currents. B. S. Cohen. 141—3-1-08. Mr. Cohen, who has already presented a number of very instructive papers upon telephone transmission measurements, presents a description of the barretter, which is an arrangement of impedance coils, condensers and the barretter for permitting the comparison of transmission qualities of line circuits and also the testing of transmitters, receivers, repeaters and induction coils for their transmission efficiency in terms of a standardized sample. This is a very interesting article, and, as the editor understands it, the barretter is an article which can be purchased in the open market.

Power Plant for Common Battery Exchanges. J. R. Milnes. 141—3-1-08. This is a second installment of an article upon power plants. Space will not permit of referring to the different elements of the power plant discussed by the author, but it may be mentioned that the operation of the alternating current rectifier is carefully gone into. A discussion of the Nodon valve being presented as well as the mercury arc rectifier. It appears that the efficiency of the thirty ampere mercury arc rectifier when operated on a 220 volt sixty cycle alternating current is over seventy-six per cent from one-quarter to full load.

Primary Batteries. W. J. Stanton. 111—3-1-08. In the present installment of the series, the author discusses electrification, referring to elementary measurements, electrochemical effects and presenting a novel form of hydrothermal analogy.

Telephone Accounting. G. R. Fawkes. 111—3-1-08. In the present installment of this series, subscribers' records and accounts are gone into. Different card forms are presented.

Oscillograph Records of Telephone Speech. Bela Gati. 161—2-15-08. An illustration is presented, together with a short discussion, showing the different forms of oscillograph records. Vowels only are discussed, and a brief reference is made to the difference between the curves of vowels when produced by English speaking and German speaking persons.

Telephone Rates in Germany. 161—2-15-08. The German publications are giving considerable attention to the revision of telephone rates throughout Germany. The discussion covers both long distance and local service, and particularly refers to the abolishing of flat rates and the adoption of the message rate of charge for telephone service.

Comments on Operating Room Control. J. Putnam. 121—3-7-08. This is a general discussion of operating room control and covers a discussion of lost call records. The article is to be continued.

Toll Accounting and Toll Errors. E. C. Blomeyer. 121—3-7-08. A general discussion, accompanied by numerous card forms, is presented and shows methods used by the Southeast Missouri Telephone Company. The finding of errors is discussed, and also interchange settlements and errors.

Long Distance Operating. Miss M. McKain. 133—3-1-08. A short discussion of the responsibilities of a chief operator in the direction of selecting suitable help for long distance switchboards. It is concluded that the best operators are produced when trained between eighteen and twenty-five years old.

Wireless Telegraphy and Telephony. 161—2-1-08. A general discussion of the application of wireless telephony in connection with automobile service, permitting connections being produced with moving vehicles. Also discussion of the theoretical operation of wireless telephony.

Static Discharges From Long Distance Lines. Vollschwitz. 161—2-1-08. Every one having to do with the operation of long distance lines, particularly circuits which are highly insulated, have observed during cold weather, or during periods of dry snowfalls, that electrical discharges are obtained from the long distance lines. This, of course, has always been attributed to the electricity generated through contact between the snow flakes and the wires. It has further been observed that the discharges are increased in intensity, and become decidedly painful to the telephone users during snowstorms or even hailstorms when driven by a strong wind. The present author discusses the problem from three standpoints: First, the effects produced through hail and snow storms combined with strong winds; second, the effects of high insulation upon the discharges; third, the presence of carbon or vacuum lightning arresters upon the circuits. He concludes by stating that the noises are increased by applying the types of arresters mentioned above and ends the discussion by suggesting that if a plain resistance or impedance coil is connected from line to earth measuring from 10,000 to 20,000 ohms no discharges are observed, but further investigations are being made before final remedies can be recommended.

Intercommunicating Systems. 171—11-1-07. This is the second installment of a general illustrated article pertaining to the construction and operation of an intercommunicating system. Lever switches are provided for the purpose of connecting together certain lines and a complete circuit diagram shows the manner in which the communications are established.

Ducretet Tele-micro-phonograph. A. de Courcy. 104—2-15-08. The arrangement described and illustrated consists of a graphophone arrangement which is connected to a microphone transmitter in a suitable manner for permitting the transmission of speeches or music. Instruments of this kind have been exploited for sometime past and appear to find considerable favor from an entertainment standpoint, although it appears to have been applied with success for aiding such persons as are afflicted with a defective hearing.

Outside Telephone Construction. C. E. Fleager. 104—2-15-08. In a lecture delivered at the College of Engineering, University of Washington, the author discusses underground conduits, covering the laying of ducts, installing of manholes, lateral conduits, installation of cable and splicing of same and connecting all terminals, concluding with a discussion of the pole line, stringing of aerial cable, attaching overhead terminals and bonding of cables.

Protection of Telephones. F. H. Ward. 131—1-1-08. The application of telephone service in connection with high tension transmission systems is interesting owing to the necessity for carefully protecting the telephone circuit against inductive disturbances from the high tension line, and also protecting the telephone users against accidental shocks owing to the telephone line becoming charged as a whole. Different methods are shown, covering several types of lightning arresters and two circuit connections. One of the diagrams illustrates the wiring where a telephone line runs upon the same pole line carrying a 15,000-volt circuit. The telephone circuit is grounded through an impedance coil. In operating systems, however, over 15,000-volts in potential, a transformer connection is established between the telephone instrument and the line, and the side of the transformer is grounded at the center to remove any induced charges upon the telephone circuit.

Talking by Wireless. Dr. A. Gradenwitz. 111—2-1-08. A short illustrated description of the Ruhmer system of

wireless telephony. An induction coil and different circuit connections are shown.

Telephone Accounting. G. R. Fawkes. 111—2-1-08. The fifth installment covering the functions and methods of accounting departments for telephone companies is presented. A general analysis of the different accounting forms is described. The information contained in these articles has already been referred to as being of value.

Elementary Chemistry of the Primary Cell. W. J. Stanton. 111—2-1-08. In the present article Mr. Stanton discusses the battery proposition from a scientific standpoint. He carefully explains what molecules are and discusses the probable character of an atom. The article is to be continued and should be studied by anyone interested in the chemistry of batteries.

Power Plant for Common Battery Exchanges. J. R. Milnes. 141—2-1-08. Articles when written by practical men are always of interest. In the present paper, the author who is in the chief engineer's department of the National Telephone Company, of London, England, discusses in an interesting manner the different equipments required in connection with telephone power plants, covering the operation of generators, ringing machines, interrupters and circuit breakers together with polarized relays and electrolytic rectifiers. The series is to be continued. Among some of the suggestions it is recommended that when taking specific gravity readings of a storage battery, it should always be done at least a half hour after the battery has been discharged, for immediately after a charge the electrolyte contains a large amount of gas and therefore results in an incorrect specific gravity reading. It is further stated that the same hydrometer should be used in taking readings from different cells. Suggestions are further made that serious damages are liable to result through repeatedly overcharging a storage battery. Further, that in order to obtain the best results from a battery a complete discharge should be taken occasionally. It is stated that over-charging a battery affects both plates and that under-charging only affects the negative plate and gives rise to sulphating. In discussing the battery room, the author states the maximum temperature should be 90 degrees Fahrenheit, as too warm a room injures a storage battery, tending to shorten its life. Plaster ceilings are dangerous to have over a battery for the gasing of the battery is likely to loosen the plaster, and when lime enters the solution it is bad for the cell.

A New Long Distance Switchboard in Berlin. 171—12-1-07. This description is illustrated with circuit diagrams and shows the general arrangement of a 500-line capacity, 250 lines installed equipment. This board is supplied with forty-two regular positions for day service, thirteen recording positions and four positions for night service. It appears that nearly 150 lines have been equipped with duplex apparatus. Those who have studied the telephone situation in Europe are familiar with the large amount of phantom work which has been operated for the past twenty years, most of the systems being based upon the simplex plan, an impedance coil being bridged across the line and the phantom circuit obtained through being connected to the center of the impedance coil.

Earth Wires in Coal Pits. S. F. Walker. 146—1-31-08. In a letter to the above journal, Mr. Walker draws attention to a paper which he read before the Institute of Mining Engineers, in 1906, in which he discussed the difficulty of producing ground connections in coal mines. In the present letter it is stated that producing an earth in a mine of any kind is exceedingly difficult and that the safest plan to adopt would be to run a separate ground conductor. This, of course, applies more particularly to electric lighting systems, but it may be of interest to telephone workers should they attempt to establish ground connections in coal mines.

NEW PLANT AT LEAVENWORTH, KAN.

Description of Fine Building and Equipment of the People's Home Independent Telephone Company.

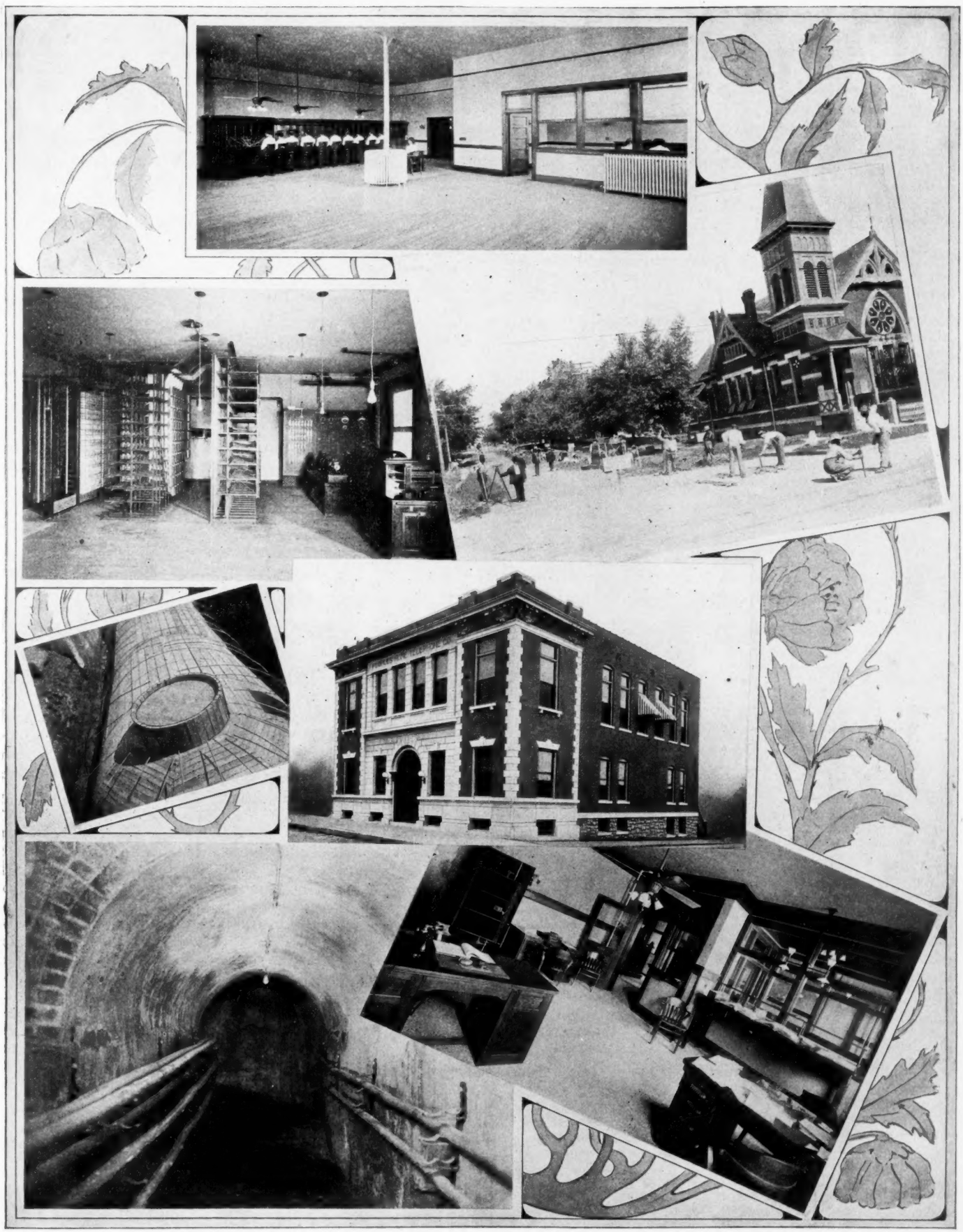
By J. Fred Malthaner.

THE fine new building recently erected by the People's Home Telephone Company of Leavenworth, Kansas, at the corner of Delaware and Sixth streets, is pronounced by experts to be one of the most complete and modern telephone buildings in the state. The structure is strictly fireproof throughout, and no expense has been spared to make it a credit to the city and thoroughly adapted to the needs of this flourishing Independent company. The accompanying illustrations show views of the various rooms and departments. The general business offices are furnished with massive oak furniture, and the building is well lighted with windows of French plate glass, all the woodwork being quarter-sawed oak finished in oriental green. In the main hall are two long distance telephone booths, constructed so as to afford perfect ventilation, light and comfort. The ceiling of the vestibule and hall is of paneled oak, finished in oriental green, and studded with electric lights. The floors are finished in Italian marble and present a most artistic appearance.

Directly in the rear of the office is the terminal room, with the usual fittings, and the assignment of the apparatus is excellent. The wire chief's desk is located in such a manner as to command a general view of the room, and the meters on the power board can be readily seen without leaving the desk. The desk is located a sufficient distance from the machine table, so that no inconvenience is experienced when testing. The desk is equipped with the usual standard testing circuits. In addition, the extra pair of each cable is connected through a sensitive 1,000-ohm relay line compound jack, in order that the installers and trouble men may have direct service to the wire chief when calling for a test from the terminals of any cable. This eliminates the trouble experienced by troublemen connecting these test instruments to a subscriber's line, and causing the bells to tap, which invariably brings the subscriber to the telephone.

The extra pair also acts as a picket and will detect moisture in a cable long before any of the line relays are actuated. The adjustment of the 1,000-ohm relay is such that they are sensitive whenever the insulation of the cable drops under 30,000 ohms.

The operating room is remarkably spacious and well lighted. The ceiling of this room is eighteen feet in height and is arranged for perfect ventilation. The switchboard, at present, occupies a part of the north and the entire east side of the room, and is finished in Flemish oak, as is also the woodwork of the entire room. In building the plant the company provided for an ultimate capacity of 7,000 subscribers. This number of telephone users may seem large for a city the size of Leavenworth, nevertheless, with the continuance of the very substantial growth the city has experienced within the past few years, the com-



Building, exchange views and construction of the Leavenworth, Kansas, Independent telephone system.

pany feels justified in predicting a subscription list of 7,000 subscribers within the near future.

The switchboard and all apparatus were furnished by the Stromberg-Carlson Telephone Manufacturing Company. The board, at present, is equipped to 1,440 central energy lines and forty generators call rural lines. Each position is equipped with fifteen pairs of cords and four-party keys, and 160 lamp lines. The four frequency system of ringing is employed for party lines.

The growth of the plant has been such that an additional section has been installed since the building was first occupied. Separated from the main operating room by a glass partition is the toll room. The equipment consists of a two-position latest type Stromberg-Carlson toll board. In the rear of the operating room are arranged the locker and toilet rooms, hospital and a well furnished and comfortable recreation room.

In the cable tunnel, there are seven large lead-covered cables, each containing 400 pairs No. 22 B. and S. double wrap conductors. The cable is .012 capacity, and was furnished by John A. Roebling's Son's Company. The total amount of cable installed in the plant at the present time aggregates 102,104 feet of all sizes. All cables larger than 150 pairs are placed underground. The distribution is all cable and the aerial cables range in size from 150 pairs down to ten pairs. All can tops and the protection apparatus on the main distributing frame were purchased from the American Electric Fuse Company. The walls of the tunnel are ten inches at the base and gradually taper to six inches for top and roof.

The accompanying illustration shows a familiar scene during the fall of 1906, when the underground construction crew, composed of over a hundred workmen, was engaged in laying conduit. There are 73,000 feet of underground conduit laid in over 16,000 feet of trench.

In the construction of the Leavenworth plant, the company has continually kept in mind the fact that the best is none too good, especially in telephony. The results attained can be best judged from the accompanying illustrations.

The officials of the People's Home Telephone Company of Leavenworth are as follows: William T. Hewitt, president, Leavenworth, Kan.; William George, vice president, Aurora, Ill.; L. R. Parker, secretary and general manager, Aurora, Ill.; A. B. Conklin, treasurer, Aurora, Ill.; J. Fred Malthaner, constructing engineer, Minneapolis, Minn.

The last three mentioned of these gentlemen are well known in the Independent field, having been active in their fight against the Bell octopus for the past twelve years.

The unanimous support given the People's Home Company in Leavenworth, indicates that the Bell company in this locality will be a thing of the past in the not distant future.

THE OHIO CONVENTION

A Report of the Annual Meeting of the Buckeye Independents.

By E. S. Snow.

THE annual convention of the Ohio Independent Telephone Association was held at Columbus, Ohio, on March 19. On account of the illness of the mayor the address of welcome was made by Edward L. Weinland of the city law department and by J. Y. Bassell, secretary of the Columbus Board of Trade. Mr. Weinland, in welcoming the visiting telephone men said in part:

"Mr. President and gentlemen of the convention. No one regrets more than I that the mayor is a sick man to-day and is unable to come down and greet you. The mayor and other officials about the city hall have formed the pleasant habit of dropping in upon the law department to straighten out their little difficulties, and so I think as a matter of habit they have appointed me to come down and represent the mayor, which I am sure I can do very inadequately. There was no opportunity to prepare an address of welcome to you. Fortunately, I think for me in addressing your body, I need no time to prepare an address of welcome because welcome to this body springs from the heart spontaneously. There is no body of men I think in the commercial world and in the business world and in our every-day lives, appeals more strongly to us, to the average man, than the telephone men. There is no industry that appeals to us so strongly as the telephone. There is no agency known to science or to commerce in my judgment that has done so much for this world's progress; that has brought mankind so close to mankind; that has brought the world into touch with itself so completely as has the telephone, and there is no branch of telephone business, gentlemen of the convention, that it seems to me is entitled to such credit as is your branch, the Independent telephone. The telephone, I think, is about as old as I am, at least I think I can remember its first installation in commercial and business use. But, gentlemen, all through the development of the telephone business, and up until comparatively a recent date, the telephone business was what we were pleased to call a natural monopoly. Now some will contend that it is in its nature a natural monopoly. That may be true, but never until the Independent telephone came to this town to stay and other cities of this state and other states of the union, never until that time did we have real telephone service. I congratulate you upon bringing to the people the use of the telephone, a use which appeals to every one of us and which appeals to every man in business, and every family, and makes all men akin and brings them all heart to heart and face to face. I congratulate you upon being pioneers and the originators of that great industry which has brought us together in that way. Now I do not want to make an address, but I wish to say in behalf of the mayor and in behalf of the city officially and in behalf of our citizens, that no body of men could be more welcome than you in your convention here. I trust you will find it convenient to come here every year and make it your permanent abiding place. So on behalf of the mayor and on behalf of the city, gentlemen, I wish to extend to you the heartiest welcome you can receive and I want to say if you will connect yourselves with the city's hospitality you will not get a busy-buzz and you will not be told that the line is out of order; that you will not be told to wait a minute, but you will get a quick, clear and ready response and I hope you will avail yourselves of it."

On behalf of the Board of Trade of Columbus, Mr. Bassell extended a warm welcome to the delegates. He said:

"I want to say, gentlemen of this convention, however, that while it is my official duty as secretary of the Columbus Board of Trade, and my pleasure as well, to extend words of welcome and greetings to conventions meeting in our city, I speak but the truth when I say that it has never been my pleasure to welcome more heartily a convention to this city than I find in welcoming you. It is meet that the capital city of the great state of Ohio should welcome to its confines a body of men who have possibly done more to bring into close and pleasant relationship communities and individuals than any other industry in the world.

"I recall some years ago, when it was talked of establishing a competitive enterprise in this city to be known as the Citizens' Telephone Company, that it was said that it would be a nuisance to have two telephones on your desk; it would make the service that then was a very much worse service and that everybody would be crying out against it in a very short time after its installation. Now I want to say to you gentlemen that the two thousand telephones that were then in use in this city prior to the establishment of the Citizens' Telephone Company have grown as if touched by some magic wand and more than twenty-two thousand telephones to-day comprise the service in this city, and more and better service could not be obtained anywhere. It made the Bell service infinitely better than it ever was before, because it put them on their tiptoes, to continue in business and live, and the Citizens' Telephone Company, anxious to engraft itself into the good graces and the good will of the people by the good service that they rendered, were also on their tiptoes from the start to the finish, and it has given to this city to-day as good telephone service as can be found in any city in America, bar none.

"Now I take it that your system throughout the various cities of this state have done the same service for every place that you found a home, and it is to-day a fact, and I attribute that fact to the existence of your association and the adherent parts thereof, that Ohio has the best and most complete telephone system of all the sister states of this great Union of ours.

"Now I could talk indefinitely because my soul is filled with the sense of absolute appreciation of what you gentlemen have done in the development of this state. I could talk on, as I say, extensively. Why? The fact should be appreciated that I recognize that you are here to hold a convention which meeting is one of importance and I will not delay you further than to say this, that the Board of Trade of Columbus, in common with the city itself, extends to you the warmest greeting and welcome, and we believe that it may be found convenient for you, occupying the geographical position that the capital of this state does, to come to us again, and I say that you cannot come more frequently than our hospitable pleasure will be at your disposal. I thank you."

The response to the addresses of welcome was made by W. Gilbert Thompson, of Hamilton, Ohio, who thanked the city's representatives for the welcome extended and assured them it was a pleasure to hold the telephone convention in the capital city.

Following Mr. Thompson, Frank L. Beam, president of the association, delivered his annual address which follows in full:

ADDRESS OF PRESIDENT BEAM.

During the past six months the crucial test of corporate stability has come to every business enterprise in the United States, and by examining their financial conditions at the present day will show their faults of the past and possibilities of the future.

The past year has turned more perplexing questions in favor of Independent telephone interests than you or I ever dreamed could happen in so short a time, merely because we were doubtful of their outcome.

We desire a settlement of these perplexing questions, but the final test did not come until the past year, but when it did come it found the Independent telephone interests united in the association, ready and capable to meet the financial crisis, and legislative measures with a strength that means business and financial stability to the highest degree.

Every one is familiar with the financial crisis of the past few months for all corporations, the smoke has not yet cleared away, but for Independent telephone interests the cloud was so scattered that it passed by almost unnoticed.

In a way I believe the notice it did demand from us was more of a safeguard than a damaging force. For a moment it made us consider our progress and development from an economic point of view. Were we at fault in overestimating the amount of service in our stock of general telephone commodity, and in judging the value of our securities in a financial storm? The answer to this comes in a sentence, how many were so frightened at this panic that they wanted to get rid of their telephone securities, and what companies could not meet their dividend payments? But, some will say, sales of stock and dividends alone do not measure the value and stability of a corporation. Well, add to this its prospective or future value and you will have a basis that will satisfy the most critical student of economics.

But the Independent telephone securities conformed to all this even during the worst of the stringency; there were no telephones idle; on the other hand, the increase has been phenomenal, it has kept pace with the development of the prosperous times.

I was interested to note in an article published in one of the magazines a few days ago, entitled "The Business Outlook and Something More About Investments," the writer in his classification of manufactures and public service corporations put the telephone corporations in Class B, defining the class by the phrase, "Slight Shrinkage," and estimates the shrinkage in this class at about 3 per cent on securities and number of employes. This can be accounted for in both cases. The number of men employed during the winter months on construction naturally falls off this time of year, and no place, to my knowledge, has any telephone company lost subscribers or is there one that has not shown better collections during this period. All of this goes to show the financial crisis has not affected telephone interests, excepting to create a more pressing demand for rapid communication, and more general appreciation for the quality of the Independent telephone service.

The shrinkage of only three per cent on income and employes in the telephone business is certainly gratifying when we consider that in such enterprises as iron and steel the shrinkage has gone past the twenty-five per cent mark.

On the 8th day of last August some matters became pressing. It was deemed expedient to call a special meeting of this Ohio Independent Telephone Association at Columbus, and over 400 representative telephone men attended the meeting.

One of the important results of this meeting was the exact and defined position of the Independent telephone companies and the United States Telephone Company toward the Bell or other competing companies relative to entering into any contract or arrangement whereby competition is eliminated. This was made an impossibility, once and for all. A set of resolutions were passed by the state association and later by the United States Telephone Company touching upon this common ground.

The interests of both are purely independent by their very nature. Elimination of competition will be prosecuted to the full extent of the law, and after a violating of contract further Independent connections and service are denied.

Before a month has passed these joint resolutions served to guide the action of this association, and the action of the United States Telephone Company toward the Marion County Telephone Company in one of the most important combinations ever made in the United States between the opposition and any Independent company. The condition at Marion brought the fight between the Independents and Bell companies into court. This association and the United States Telephone Company defined its policy definitely in its set of resolutions of August 6th that they would not countenance any exchange of favors with the Bell company, and the state law known as the Valentine law prohibits competing companies to sell or combine, and thus eliminated established competition. The difficulty at Marion is now being contested in the court, and from all indications its decision will be favorable to the Independent telephone interests.

The Bell company has been fighting, and is now fighting, the Independent companies with but one aim in view and that is, to eliminate them from the field, and now we cannot look upon any compromise or exchange of favors but with a feeling of distrust.

During the months of November and December district meetings were held. Never in the history of the association have these meetings been so successful and largely attended. The reports from all the districts showed a substantial gain during the six months prior to October 1 and the companies to be in good financial condition.

As to legislative matters. There seems to be a desire on the part of a number of the members of the General Assembly to have some laws passed regulating telephone companies. In no single

instance have we found this demand coming from the people. There have been bills of various kinds introduced at each session of the legislature for the past eight years to regulate telephone companies. We have always been able to show that competition in the telephone business was the best regulator of cost and quality of service given, and in this way the public were protected There have been more bills introduced in the present General Assembly affecting the telephone business than at any previous session. I will refer but briefly to them as you are all more or less familiar with their provisions. Senator Howe introduced a bill known as Senate Bill No. 313, which proposed a tax on telephone companies, which would, if passed, be equal to confiscation of telephone property. The Ely bill, which proposes giving the Railroad Commission of Ohio jurisdiction over telephone companies, requiring interchange of service between competing telephone companies, both local and long-distance. While we are not seriously opposing the commission fixing rates, we are decidedly opposed to a law compelling an interchange of business, for this would be the first step in the direction of the elimination of competition, which has been the prime factor of the great telephone development of Ohio. There are several other bills pending giving the city councils the right to fix telephone rates. These bills have all been strenuously opposed by the association.

I have given you briefly a synopsis of the bills that have been introduced, and from the number has undoubtedly created some agitation for laws governing telephone companies.

The association, realizing that some definite action would be taken during the present General Assembly, made suggestions in the drafting of a bill which would protect the public against combinations and at the same time protect the interest of the stockholders. I refer to the Stewart bill, known as House Bill No. 1037, now before the 77th General Assembly of Ohio. It is certainly worth the earnest attention and support of every Independent telephone company, and when it becomes a law, the majority of our troubles with the Bell company, such as cutting rates or buying out and our difficulties in getting right of way and franchise privileges will be a thing of the past. It is a measure that we have desired for several years and we cannot see it fail.

As a closing word let me urge upon you, if there is any influence you can exert or any pressure that you can bring to bear to foster and secure the passage of this bill, don't let the opportunity pass by without making the best of it.

Following the address of President Beam, the report of the secretary, O. O. Welsheimer, was read and approved, as was the report of the treasurer, Ralph Reamer.

The following committees were then appointed:

Auditing: G. H. Carter, Mansfield; S. E. Ward, Delaware; H. E. Curran, Elyria.

Nomination: G. P. Thorpe, Wilmington; S. R. Newberry, Ashtabula; S. Guy Jones, Columbus.

Constitutional Amendments: W. L. Cary, Cleveland; H. P. Folsom, Circleville; D. J. Cable, Lima.

The reports of districts, all of which were represented, were then received.

A. C Lindemuth, President of the International Independent Telephone Association, then made an address similar to the one read before the Iowa association and which appears in this issue. The Lindemuth address was followed by J. B. Ware, Secretary of the International Independent Telephone Association, Mr. Barnes of Fairmont, W. Va., W. C. Polk and E. S. Cline, of Toledo, and A. C. Davis, President of the West Virginia Independent Telephone Association, who made short addresses.

The committee on legislation submitted its report, which embodied the following resolution:

"Whereas, we, members of the Ohio Independent Telephone Association, in convention assembled, representing more than three hundred and fifty Independent companies, twenty-five thousand local stockholders and three hundred thousand subscribers, have heretofore announced and now reiterate our belief in the principle of competition as against combination and monopoly in telephone service; and

"Whereas, we believe in the reasonable regulation of telephone rates and are opposed to unjust discrimination therein; and

"Whereas, House Bill No. 1037, by Mr. Stewart, accords with our views herein expressed, and if enacted into law, we believe will subserve the best interests of the Independent telephone companies of Ohio, and particularly of citizens and telephone users in general; therefore,

"Be It Resolved, That this association heartily endorses said bill, favors its enactment into law and recommends it to the favorable consideration and support of its members."

This resolution was signed by W. G. Thompson, Chairman; W. L. Cary, Jr., G. Y. McVey, Cyrus Huling, G. P. Thorpe, James S. Brailey, Jr., and Dwight E. Sapp.

After a discussion of legislative matters by Cyrus Huling of Columbus, the convention unanimously adopted the resolution.

A number of other prominent Ohio telephone men made short talks to the convention, telling of the conditions in different parts of the state, and the progress which has been made since the last convention. All reports were of a flattering nature and show the Independents to be in a very prosperous condition in all parts of Ohio. A great amount of new work and extensions is being planned for 1908.

Some remarks by D. C. Warner, concerning the situation in Clermont county followed.

In response to an appeal by Mr. Beam, the convention spontaneously pledged about $2,400 to further the work of the association.

The following officers were elected for the ensuing year: Frank L. Beam, Mt. Vernon, president; O. O. Welsheimer, Columbus, secretary, and Ralph R. Reamer, Columbus, treasurer. Delegates and alternates-at-large to the International convention were named as follows:

Delegates:	Alternates:
J. C. Boush, Cleveland.	F. A. Knapp, Bellevue.
G. H. Metheany, Lima.	H. Hildebrandt, Washington.
O. J. Hess, Sidney.	C. C. Heller, Beaver Dam.
E. L. Barber, Wauseon.	G. Adams, Millersburg.
Lewis Brucker, Mansfield.	Chas. Heinlein, Bridgeport.
L. M. Flesh, Piqua.	D. O'Dell, Springfield.
Washington Hyde, Warren.	J. G. Steinkamp, Elmore.
G. R. Johnston, Columbus.	H. M. Allen, Troy.
C. H. Marvin, Urbana.	J. Babst, Crestline.
C. Y. McVey, Cleveland.	E. L. Coen, Caldwell.
H. P. Swisher, Newark.	D. H. Fuller, Clyde.
W. F. Laubach, Akron.	I. H. Thiedick, Sidney.
H. L. Beatty, Ravenna.	J. McDowell, Ironton.
J. S. Brailey, Jr., Toledo.	W. A. Norton, Kenton.
F. L. Beam, Mt. Vernon.	O. L. Spangler, Bryan.
W. R. Fee, Portsmouth.	C. D. Young, Delaware.
J. B. Hoge, Cleveland.	W. H. Bowron, Vermilion.
C. L. Jones, Athens.	Chas. Duncan, Chillicothe.
J. Mallahan, Ottawa.	A. V. Hageman, Lorain.
R. M. McLaughlin, Carrollton.	N. Liggett, Marysville.
S. B. Rankin, S. Charleston.	G. E. Nungester, Celina.
G. P. Thorpe, Wilmington.	J. F. Smith, Cadiz.
	S. E. Ward, Mansfield.

Governor A. L. Harris received the delegates between 7:30 and 8:30 o'clock p. m.

A very enjoyable banquet and program of toasts and music closed the convention.

LIST OF EXHIBITORS

The Sterling Electric Company, LaFayette, Indiana, represented by W. E. Doolittle, C. R. Brown and G. W. Metcalf, exhibited a complete line of telephone apparatus.

The Standard Telephone Manufacturing Company, Portsmouth, Ohio, represented by W. R. Fee, exhibited the company's line of magneto common battery and selective ringing telephones.

Miller Anchor Company, Norwalk, Ohio, represented by G. H. Miller, exhibited the Miller anchor.

The Bluffton Anchor Company, Bluffton, Ohio, represented by C. F. Dillman, exhibited the Bluffton anchor.

W. N. Matthews & Brother, St. Louis, Missouri, represented by O. R. Johann, exhibited the Stombaugh guy anchors and the Hargis joints.

F. B. Cook, Chicago, Illinois, represented by S. C. Harvey, exhibited a line of telephone protective apparatus and accessories.

The Dean Electric Company, Elyria, Ohio, represented by A. J. Beam, R. H. Manson, E. L. Klingel, W. H. Scott and A. J. Roberts, exhibited a complete line of telephone apparatus.

The American Electric Telephone Company, Chicago, Illinois, represented by M. Zabel and A. B. Ferdinand, exhibited the American line of telephone apparatus.

Digest of Telephone Patents

By Edward E. Clement

879,425. Electric Generator for Telephone Lines. Tideman. The distinguishing feature of this invention consists in the provision of two semi-circular segments on a shaft, and two conducting circular segments having a reduced diameter through half of the circumference, the latter segments being separated by an insulating segment. Application filed January 16, 1905. Patent unassigned.

879,438. Telephony. Brooks. The "side tone" heard in the receiver of the ordinary line is prevented by balancing the windings of associated inductive coils. Application filed May 31, 1906. Patent unassigned.

879,454. Telephone Exchange Apparatus. Fricke. By this invention the separation of the signal-controlling circuits supplied from a common battery is permitted, while the continuity of the telephone circuits is maintained. Application filed March 8, 1907. Patent assigned to Monarch Telephone Manufacturing Company.

879,643. Telephone Circuit. Jacobs & Thorrowgood. The phonopore winding of the receiver and the secondary of the telephone transformer are arranged in parallel. This results in obtaining a maximum volume of current and in the elimination of the effect of low frequencies in the receiver. Application filed Oct. 12, 1906. Patent unassigned.

879,650. Electric Transmission of Intelligence. Kitsee. The inventor's purpose is to render the inductive influence of neighboring wires ineffective on instruments used on transmission lines. Application filed May 14, 1906. Patent assigned one-half to William G. Latta.

879,651. Electric Transmission of Intelligence. Kitsee. This invention also has for its object the elimination of disastrous effects upon transmission wires of the induction due to neighboring wires. Application filed January 6, 1907. Patent unassigned.

880,155. Automatic Telephone Alarm. Murdock & Gallagher. This invention comprises an audible alarm, actuated by clock work contained in a cabinet, and means is provided by which the clock work may also lift the receiver hook of the telephone. Application filed March 25, 1907. Patent assigned to Murdock.

880,160. Burglar Alarm System and Apparatus Therefor. Ney & Ullman. This device is designed to close the circuit through a bell and to actuate a hook-raising means attached to a desk telephone set and operates through a spring-actuated contact mechanism. Application filed Sept. 25, 1907. Patent unassigned.

880,537. Telephone Dictating System or Apparatus. Kelly. The object of this device is to provide means by which one may dictate to a stenographer who is located at some distant point. Application filed April 27, 1907. Patent assigned to General Acoustic Company.

12,756. (Reissue) Telephone System. Burke. This is a multiple board central system comprising jacks, each set of which is connected together by a single line, and connecting plugs, each pair of which is connected by a single strand. Application for reissue filed Oct. 25, 1907. Patent unassigned.

881,360. Telephone Relay. Underwood. The object of this invention is to augment the effect of the electrical impulses for the transmission of intelligence, by supporting a small armature adjacent to the poles of the receiver magnet, and by connecting the armature to a telephonic transmitter element arranged to act upon a second line. Application filed July 6, 1907. Patent unassigned.

881,447. Apparatus for Registering Telephonic Calls. Sharer. This device has a handle arranged to move in two directions and means is provided for producing a signal to indicate the operation of the device, at each movement of the handle in either direction. Application filed April 26, 1907. Patent assigned to Keystone Telephone Company.

881,628. Telephone Cut-Out. Smith. This device consists of a plurality of magnets, one for each party line, having a common armature and arranged to move the armature when one line is calling, and to break the circuit of the other lines. Application filed July 12, 1907. Patent unassigned.

881,652. Coin-Controlled Mechanism for Telephone Boxes and the Like. Bee. This device is provided with an operating shaft and a series of kick-off fingers carried by the shaft and means for holding a coin in a slot until the fingers have been brought into operative position. Application filed Sept. 12, 1906. Patent unassigned.

881,712. Telephone Receiver. Pape. This receiver comprises a casing and removable front and rear caps, one serving to retain the diaphragm and the other the mounting of an armature connected to the diaphragm. Application filed June 16, 1904. Patent unassigned.

881,878. Telephone Switch. Wright. This switch comprises a base plate, conductors having openings, secured to the base plate and circuit-closing plugs. Application filed July 8, 1907. One-third patent assigned to Harney L. Hill.

DELIVERING MAIL BY TELEPHONE.

"THE postmaster-general has been asked, by one of the western senators, to inform the senate to what extent and in what measure the telephone is used in the collection of special delivery mail matter, and whether, in his opinion, special rural telephone delivery of mail is feasible," says the York (Pa.) Gazette. "The senator says that, since nearly all farmers have telephones, he wants an appropriation to test a plan whereby the postmaster or his clerk can open special delivery letters and read them over the telephone to the addressees in the country.

"It may be seen, however, that objections to this scheme will readily suggest themselves, even in addition to the prejudice most people may entertain against having their letters opened in transit, by morbidly curious people. The regular task of reading the postal cards, which pass through their hands, is hard enough work for rural postmasters and their female clerks to attend to, without compelling them to read letters and shout their contents over the telephone."

POSSIBILITIES OF THE TELEPHONE BUSINESS

A Paper Read Before the Ohio Independent Telephone Association at Columbus, Ohio.

By G. R. Johnston.

RECENTLY in connection with an argument favoring competition in the telephone business, there were mentioned among the expectations from competition, the encouragement of invention, the continuance of growth, and the development of the possibilities of the business. This paper is an attempt to expand upon these texts. In the nature of the case this is suggestive only. If we knew just how to invent, we would be using the inventions; and if we were certain of the possibilities of the business, we would be developing them. Nevertheless, it may be worth while to attempt to forecast roughly some of the directions which invention and development may take. The general subject may be considered under four heads: namely, increases in revenue, economizing processes, by-products, combinations of interests.

We are accustomed to say we think telephone development has only fairly begun. A rough analysis of the situation in Columbus shows about as follows: Of the 11,000 telephones which the Citizens' company had at a recent date, 4,900 were business, 5,600 residence, 300 rural, 170 in hotel and apartment house rooms, and 30 pay-station. As nearly as we know, the Bell proportion of residence telephones in Columbus is much higher. The different business names in the directories of the two companies number about half the business names in the city directory. If there are forty thousand households within range of the Columbus exchanges and half of them are possible subscribers, then the two telephone companies do not reach much more than half of these.

The extension service does not appear to be at all developed. The Citizens' company has, without counting the private branch exchange stations, a little more than twenty-five per cent as many extensions as main line business telephones and only about six per cent as many extensions as main line residence telephones. It seems a safe prediction that as both business establishments and households get more accustomed to the convenience and low cost of extension instruments, they will become more popular. I do not know that any telephone manager is thoroughly convinced that he knows the rate for extensions that brings the greatest net return. An extension telephone is much more profitable than a main line telephone at four or five times the charge. To what extent the business would be stimulated by reducing the extension rate to a small sum above cost is a question that we hope some companies' experiments will answer.

I think it may be safely assumed that the private branch exchange service is destined to grow very largely in factories, offices, stores, etc., both for intercommunicating purposes in the establishments and for public communication through the main exchange. The two telephone companies in Columbus have about 125 subscribers to private branch exchanges, with probably 1,500 stations, including nearly 500 in hotels and apartment houses. It ought not to be very long before practically every hotel and apartment house room of any good grade will have telephone connection, since it offers the guests and permanent residents so many advantages at low cost or even with a saving to the landlord. There should be five times as many of these telephones in Columbus as now.

In local pay-station service Columbus is only picking up a few nickels here and there. The general public expects to use without cost some convenient merchant's telephone at will. Probably by a gradual process the telephone companies will get pay for calls from non-subscribers in cities of smaller and smaller size than at present. The free service now is educating some of the public to become subscribers and others to perceive the value of the calls that after a while they will pay for. A very small proportion of Columbus business houses have more than one trunk line on their systems. As business comes to be done more freely over the telephone, and particularly as purchasing by telephone comes to be more of a habit, the business establishments will learn to provide ample facilities for receiving and transmitting telephone calls. It is a rare thing now for a grocer, for example, to have more than one line on either system, while many of them grumble at the expense for the two lines for the two systems, yet the profits from one good customer will pay for a line, while to control their trade a grocer could almost, if not quite, afford to pay for all his customers' residence telephones.

Ten or twelve years ago on High street there were very few display show windows. In that time the merchants have learned to replace their narrow, ill-lighted windows with large glass fronts, and to display their attractive goods. In about the same period advertising in other ways has multiplied many fold. Those advertising expenditures have not been simply to keep from losing business to competitors—they have been productive of new business far beyond their costs. Within the next ten or twelve years the use of business telephones will, I should say, be expanded in about the same manner.

In Franklin county, beyond the limits of the Columbus exchange, are less than three thousand telephones in probably ten or eleven thousand households. This number ought to be easily doubled if not trebled. After a while the farmer who has figured that it is cheaper to pay trolley fare than to feed a horse, may figure that it is cheaper to keep telephones at more than one place on a large farm.

As telephones multiply there will be at least a corresponding increase in the long-distance business. It looks as though that increase ought to be in proportion greater than the instrument increase. Now the monthly long-distance business in Columbus comes from about one-third of the subscribers. This proportion has grown in the past and should continue to grow in the future. Two-thirds of this third pay less than fifty cents. The long-distance telephone service offers social and business advantages that cannot be had through any other agency. There are two reasons why the toll business is not larger; one, because the facilities are not greater; and the other, because the public is only beginning to become educated to the use of the service. The increase in local and toll line facilities will operate both to take care of all business that is now offering and to educate the public more rapidly. The illustrations I have chosen from Columbus conditions are applicable with probably even greater force throughout most of Ohio and the United States.

Heretofore such saving processes as have been devised

and applied to telephone systems have not benefited the companies so much as the public. On the whole they seem to have done little more than to offset the increases in cost due to enlargement of the telephone exchanges and consequent greater cost per line, to abandonment of obsolete forms of equipment before their wearing out, and to general advances in costs of material and labor. After a while it should be the telephone companies' turn to reap the benefits of invention.

Substitution of machinery for operators is under headway and is lessening costs. Simplification of such machinery is also in process.

The most expensive item in telephone construction is cable. A very large proportion of this cable is idle for a very large proportion of the time. Any device that will cut the cable demands down to the requirements for use will result in great savings. Engineers are working in this direction with what seem to be fair prospects of success, through adoption of trunking systems with a small trunking unit. Attempts to give telephone service over one wire using the ground or a common return wire have very largely been abandoned as impracticable, yet there still may be some good return device invented that will reduce the number of wires without interference. If the tip or vertical side of one circuit could be made the sleeve or rotary side of the next, then twenty-five circuits could be made of twenty-six wires instead of fifty as now.

The adoption of phantom circuits in local and long-distance work opens up a large field of possible economy that is only just begun to be worked. Such circuits, as do other improvements, require first-class physical circuits; but, then, for other reasons such circuits are economical. The chief engineer of the Pennsylvania Railroad used to say "The cheapest way to operate a railroad is to keep the track in first-class condition all the time." The same may be said by telephone engineers of their circuits. The invention of a satisfactory lockout system may permit the placing of a larger number of parties on a single line without more interference than the parties are willing to accept. Objections to lockout systems now on the market are found in the cost of clearing trouble and in the shutting out of persons who are properly entitled to the use of the line. A lockout device should require few visits, and should not interfere with the transmission of a signal from a third party to the operator to be acted upon or not according to the third party's rights.

At present long-distance operating is relatively slow. When a circuit carries as many as forty messages a day it is time for another circuit. If the circuit were confined strictly to the transmission of mesages five times as many could be handled. On our short Franklin county toll lines, by reducing the operators for calling to Columbus from three to one, who calls and disconnects with an automatic telephone, we reduced the cost and have increased the circuit capacity fifty to one hundred per cent. I am not sure this is the limit. In ordinary toll traffic, the ineffectual calling of operators to secure particular individuals takes so much circuit time that toll companies could perhaps increase their net revenues by offering a discount for calls to certain numbers or places under the charge for calls to certain individuals. Another railroad maxim is that until everything is done that can be done to increase the average trainload and thus diminish the number of trains, it is hardly worth while giving a thought to reducing the expenses per train-mile. So the telephone manager might say that until everything has been done that can be done to increase the paying load per circuit, it is hardly worth while to consider the reduction of message costs. Circuit time costs so very much more than operators' time. Whenever telephone engineers and managers become more free in their exchange and publication of information, the business will profit largely.

Telephone companies at present do not have many by-products. The only important ones I think of are the leasing of toll lines for telegraph purposes and the selling of advertising space in directories. With respect to the latter, I think the time is coming when telephone directories will be treated by general advertisers as a department of the business, just as billboards and street cars. As telephone directories come to be more and more complete directories of important people in a city, the sales of extra name service in the directory will increase. It is probable that whenever telephone companies care to get seriously down to working with the problem, they will arrange to connect subscribers so that they may listen to lectures, sermons, music, and the like. Telephone companies may find a profit in answering the telephone calls of subscribers temporarily absent. Of the various plans for messenger and patrol signal, fire and burglar alarm, and clock and ticker service that have been developed by the Western Union Telegraph Company, I have not believed that the telephone companies would ever find it profitable to take any of these up, unless it may be in fields that the telegraph company cannot well reach. For the business as previously developed or as in process of development by the telegraph company, the cost of the circuit, which is the only advantage the telephone company appears to have, is relatively small. It is possible, however, that there may be some small towns or some outlying residences which it is not worth the telegraph company's while to provide with such service that the telephone companies could take care of at a profit. No doubt the possibilities of the Telepost system of rapid telegraphy have been painted for all of you in sufficiently rosy colors.

My remarks regarding combination possibilities are even more speculative than the preceding remarks. Combinations that suggest themselves are those between co-operating telephone companies, those between competing telephone companies and those between telephone and telegraph companies. The latter is the most attractive. There does not appear to be a great deal to be gained by combination on any considerable scale between Independent telephone companies—at any rate, in the present undeveloped and experimental stage of the business. Such combination offers little saving in local expense unless by standardization, and standardization is not now altogether desirable. The general expenses which might be spread over larger systems are not now a heavy burden upon the separate companies, which as a rule get the oversight of some of the best local business men at small cost. The general expenses of Independent telephone companies seem to run much lower than those of Bell companies, so that they have a margin for much larger contributions to their state and national associations as substitutes for a large central organization. Further co-operation between the Independent telephone companies will bring them a large part of the gains they might seek through combination.

A combination between competing telephone interests looking toward monopoly could not save much expense without putting a drag upon the business. Locally they could not combine any important exchanges without increasing expenses and rates, against the wishes and the real interests of the majority of subscribers. Such monopoly would probably meet strong objections from the public and be the victim of stringent legislation that would force down the profits.

If one of the telegraph interests should combine with one of the telephone interests and the other with the other, there would be opened fields of economy and of business development. There could be kept up a real competition such as would save the competitors from damaging legislation while permitting them to retain a fair portion of the profits growing out of the combination.

Questions AND Answers By H. P. Clausen

CANNOT SIGNAL OVER LINE.

I HAVE a line six miles in length connected to a switchboard and twelve 1,600 ohm telephones. I find that I cannot ring the bells satisfactorily from the switchboard nor can the subscribers signal the switchboard. I do not think that the line is grounded and would like to know whether you can offer any suggestions.—W. H., Kansas.

The trouble you complain of is probably due to a cross in one of your telephones through which the telephone receiver is left connected to the line permanently, or perhaps the trouble is due to the generator shunt in one of the telephones not cutting out when it is standing normal. Make the following test: Have an inspector go to the first telephone on the line and ask an operator to send a signal over the line. While this is being done and with the hook switch held in its normal "not-talk position," determine whether the receiver is disconnected from the line. This you can learn by placing your ear to the receiver and listening. If clear, open the telephone and place your hand upon the gear which drives the magneto generator, and while the operator is signaling over the line observe whether the armature of the generator starts to chatter. If it does you will find the trouble due to the automatic cut-in spring of the generator not opening the circuit as it should. Make the same test at each station and you will undoubtedly locate the difficulty.

RESISTANCE MEASURING INSTRUMENT.

Can you tell me where I can obtain suitable instruments for making tests of the resistance of a telephone line and locating troubles along the line such as crosses, grounds, etc.?—J. L. P., Pennsylvania.

Instruments suitable for measuring resistances may be obtained from our advertisers of testing instruments and telephone supplies. You should make your inquiry cover a request for prices and description of resistance measuring devices.

ELECTRIC LIGHT DISTURBANCES.

We have a grounded system here and have no trouble from noises, for there is no lighting plant nor street railway within 100 miles of the city. However, a company has obtained a franchise and they now propose to install a series alternating arc circuit. What I wish to know is if we compel them to bring their return for this circuit back on the same poles that it goes out over, at least as far as it parallels our main lead, will it help our lines as regards induction or would it help our line to have one side of their circuit near ours?—P. L. C., Nebraska.

A series arc circuit when paralleling a common or earth return telephone line will cause the most disturbances when the series arc circuit return wire does not run parallel and quite close to the out-going wire. As suggested in the March TELEPHONY, where a problem similar to yours was answered, it would be best to distribute the transformers of the series alternating circuit in both limbs of the arc circuit. That is, the transformers should be distributed on both wires and, as already suggested, all lighting wires should be left as close together as possible, and while you are obtaining concessions from the lighting company you may as well insist upon their inserting a few transpositions in their leads where they come very close to your telephone wires. This will not help out much, but the probability is that it will help some. Above all, insist upon the arc circuit being kept absolutely clear from grounds, as otherwise you will find considerable trouble from inductive disturbances.

DESTRUCTION OF LEAD CABLES SUPPORTED ON BRIDGES.

Can you inform us of a good plan to run a lead cable across a river over a bridge 640 feet long, so that we may be protected against breaks in the lead cable owing to the vibration of the bridge? We have had two cables across a three span bridge and both have become crystallized and we are now obliged to replace them for the third time in the past five years.—D. P. F., Ohio.

You do not give details as to the exact arrangement of the bridge spans, but we presume that you have endeavored to support your cable at different points alongside the bridge. The great difficulty in suspending cables to a vibrating structure is that a crystallization takes places at the point where the support attaches to the cable. It is suggested that if you run a pipe across the bridge and run your cable through it supporting the pipe to the bridge instead of the cable direct, that it will undoubtedly overcome your difficulty. It is necessary to add that at the ends where your cable leaves the bridge it should be carefully looped so that any vibration between the bridge and the point where you connect the cable to the pole is taken up by a loop or "gooseneck." You will easily be able to apply the necessary precautions when it is once understood that crystallization will take place at all points where the cable is supported, and if you can support the entire cable upon the bridge as one piece (such as would be the case when you place the cable into a pipe), then the probable damage due to crystallization will be at a minimum.

IMPROPERLY ADJUSTED RINGER MOVEMENT.

We have a number of bridging telephones and the telephone in my residence has always produced a very weak ring. The tapper does not appear to be mounted very solidly. Can you tell me what to do with the instrument?—D. J., Iowa.

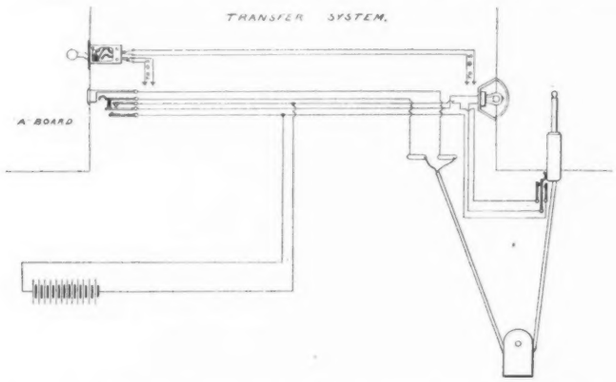
It is suggested that you carefully examine the pivot screws which hold the armature of the ringers in place. If these pivot screws are drawn up too tight, preventing a free movement of the armature, then it would be very difficult to obtain any satisfactory kind of a ring. In order to adjust the armature between the pivots it is necessary that you have a small screw driver which fits the slot in the pivot screw, and also that you have a small wrench that will firmly grip the lock nut which is placed upon the pivot screw. Place the screw driver into the slot of the screw and the wrench upon the nut, slack up the nut by turning to the left and then slack up the pivot screw. Now, receiving a signal from some distant station, carefully turn the pivot screw to the right until you find that the armature sticks through its being bound by the pivot screw. Now, holding the screw in the same position, turn the lock nut to the right, and in most cases you will find that the lock nut draws the pivot

screw out far enough to prevent it binding the armature of the ringer.

That is the adjustment you must try to obtain. After this is accomplished and the signal is still weak observe whether you have a sufficient length of stroke. In order to test this press the armature against the pole piece of one magnet and observe whether the space between the remaining end of the armature and the remaining pole piece is approximately one-sixteenth of an inch, which is about the right distance. Adjust it to this distance and make your test as before. If the results are still unsatisfactory it is suggested that you remove the ringer movement from the bell box and install another ringer and observe if it will work satisfactorily. If it does, return the old ringer to the manufacturers for repairs, as either the polarizing magnet may be weak or one of the coils has been damaged through lightning or other causes.

In looking up the question of installing trunking circuits between the different positions of my switchboard, I do not find the circuit in which there is a spring jack upon the A board and a plug and lamp signal at the C board. I should like to have the different circuit connections shown in as simple a manner as possible.—T. R., Wisconsin.

The circuit which is shown herewith and identified as "Transfer System," undoubtedly will give you the required information. As you appear to be familiar with the operation of circuits of this kind, it will not be necessary to recite in detail the different operations which it is necessary to perform. Briefly, however, when the *A* operator receives a call for connection upon a *C* board, the listening key is drawn down and the *A* operator's telephone set is connected to the *C* operator's set, and upon the *A* operator giving the order as to the line number with which a connection is called for, the *C* operator picks up the trunking plug and places it in the called for line jack. At the same time, of course, the *A* operator inserts the calling plug into the transfer jack and may thus project a signaling current over the called for party's line circuit. When the subscribers have completed their conversation, a clearing out signal is received upon the cord circuit in the *A* operator's switchboard, and the *A* operator, withdrawing the calling plug from the transfer jack, causes the signal lamp on the *C* operator's board to light, and, owing to this lamp being associated with the trunking plug, the *C* operator recognizes the signal as an order for removing the trunking plug from the subscriber's line jack and reseating the plug into its socket, thus changing the relative position of the socket switch springs and extinguishing the disconnect lamp.



A SPECIAL SERVICE REQUIREMENT.

About four miles from our town is a small settlement in which we could install about ten telephones, if it were possible to give these subscribers some sort of a service differing from the regular farmers' line service in the respect that the subscribers would be able to call each other locally without calling central, at the same time be able to call central without interfering with the local service, for about seventy-five per cent of the calls are for local subscribers. Could not the lines be brought to some central point and some apparatus installed which will permit connecting the lines to the central office automatically?—E. G., Wisconsin.

You undoubtedly understand that were you to install automatic calling telephones it would be necessary to run two wires to a central point and install suitable automatic switches. With this equipment you could signal locally without interference, or you may select a central office trunk that will call the central office. In case you do not desire to install automatic telephones together with the necessary switching apparatus, you might provide each of the ten telephones with a special switch, which is thrown either upon the local service circuit or upon the trunk line to the central office. The central office line is probably metallic circuit while your local line could be grounded. With this arrangement it would mean three wires running the circuit of the different telephones, and it would mean providing each station with signaling means of such a character that it would not interfere with the signaling service whether the telephone was upon the local circuit or upon the trunk circuit. At any rate, it would allow separate communications to be held without interference. One connection over the line to the central office and another between two telephones upon the local circuit. We recommend that you write to our advertisers in order to obtain a definite proposition upon the service you require.

LEAKAGE FROM LIGHT AND RAILWAY CIRCUITS.

We have a centralized call common battery talking switchboard system, in which a ground disconnect method of supervision is used. The lighting company uses about 3,000 volts on their arc circuit and the street car service uses 550 volts. We have considerable trouble with our bells tingling wherever the arc and street railway lines are near our circuits. This tingling has been practically overcome by fastening a spring from one side of the armature of the ringer to the base. Is there any cheaper method which will overcome the difficulty?—P. H. G., Ohio.

The trouble which you complain of is a common one wherever ground disconnect systems are operated. Your plan of putting a spring upon the armature of the ringer so as to practically make a biased ringer responsive only to currents either of an alternating character or pulsating in certain directions, is perhaps the cheapest way to overcome the difficulty. In some places a high resistance coil is inserted between the ringer and the earth, but owing to the fact that you are required to operate your supervisory relays through the ringer to earth it is necessary to keep the resistance to earth as low as possible. As a rule, it is found that telephones located in certain districts are affected more severely than located in other districts, and it might be possible to run a common return lead for the telephones in a certain district and secure relief. But, as stated before, the cheapest plan is to attach a spring to the armature of the ringers. This will in most cases stop the tingling and it is only necessary to project a sufficiently strong current over the line to operate the ringer in a satisfactory manner.

WHAT IS A CONTINUOUS RINGING KEY?

Will you kindly explain the use of a continuous ringing key in a wire chief's testing circuit. I learn that it is used for making continuity tests of repeating coils and condensers, but I do not understand why an ordinary ringing key which falls back into its normal position as soon as it is let go will not do as well as one which on being depressed or thrown will remain in its ringing position. F. A. W. Germany.

Your question can probably be best answered by understanding that when the ringing key of a wire chief's test circuit is drawn over in its ringing position, it will be necessary to lock the key in this position when the wire chief is required to take the testing terminals and apply them for testing the continuity of a coil or the circuits of a piece of apparatus. That is both hands will not be free for applying the testing circuits when the ringing key must be held down continuously. All wire chiefs' circuits have a ringing key which falls back automatically after being let

go but they must also be provided with a key which will leave the generator terminals connected to the test circuits for any length of time. That is the requirement which we believe is covered by your question as to the purpose of a continuous ringing key.

MEASURING RESISTANCE WITH A VOLTMETER.

Can you give me a formula for measuring unknown resistances with a direct-current voltmeter? The voltmeter has two scales, one of fifteen and the other one hundred and fifty volts. J. M., Michigan.

Determine the resistance of the voltmeter. Say for example the high scale winding measures 17,300 ohms, and further that you have a 110-volt direct current available. Connect the voltmeter and 110-volt current in series with the unknown resistance to be measured. Upon applying the current you will get a certain reading. Then the following will show you how the unknown resistance must be calculated:

$$X = R\left(\frac{V}{V'} - 1\right)$$

Where X equals the unknown resistance; R the resistance of the voltmeter; V the voltage of the current (110 volts, if assumed as above); V^1 deflection of voltmeter while taking reading, and 1 is a constant.

AN EXPENSIVE AND IMPRACTICAL ARRANGEMENT FOR GENERATING RINGING CURRENT.

Please advise what success I would have with a telephone generator operated upon the following plan. Take an R. R. type closed circuit battery and connect it to a small motor producing sufficient power for running a magneto generator and connect this generator to the switchboard bus bars. Advise as to the lasting qualities of the battery. We have now a pole changer installed and do not like the dry cell batteries, as we get too much amperage and not enough voltage. Please advise which would be the cheapest and most satisfactory arrangement, the motor driven equipment or the vibrator equipment? F. S. B., Ohio.

In your diagram you show one cell R R battery used in driving motor. You should have at least ten or fifteen cells before you can secure a satisfactorily high voltage for permitting the operation of the motor which will give you any satisfactory service. It is not thought necessary to figure the exact cost of operating such an arrangement as compared with a pole changer. It will cost you something like eight or ten times as much to use the motor arrangement as it would to operate the pole changer equipment. If you mean to state that you cannot secure sufficient current for operating your bells, this would indicate a defective series of cells in your pole changer or something wrong in your circuit connections. If you will give information as to the general nature of the trouble with the pole changer, we shall undoubtedly be able to give you information which will permit you to place the equipment into proper operating conditions.

SPECIFICATIONS FOR TESTING GALVANIZED IRON AND STEEL WIRE.

I have occasion to make special tests of galvanized iron and steel, and would like to know whether there are any standard methods employed by the telephone companies for making such tests. A. L. B., Indiana.

One of the largest companies in this country has a standard set of specifications for making tests of galvanized iron and steel. These specifications run as follows:

The galvanizing shall consist of a coating of zinc, evenly and uniformly applied. The zinc shall be so applied that it will adhere firmly to the surface of the iron or steel. Any specimen shall be capable of withstanding the following test:

Test.—The sample shall be immersed in a standard solution of copper sulphate for one minute and then removed, immediately washed in water thoroughly, and wiped dry. This process shall be repeated. If, after the fourth immersion, there should be a copper colored deposit on the sample or the zinc should have been removed, the lot from which the sample was taken shall be rejected.

Standard Solution.—The standard solution of copper sulphate shall consist of a solution of commercial copper sulphate crystals in water. This solution shall have a specific gravity of 1.185 at seventy degrees Fahrenheit. While a sample is being tested, the temperature of the standard solution shall at no time be less than sixty degrees Fahrenheit nor more than seventy degrees Fahrenheit.

AN INTERESTING TALK ON COMMON RETURN SYSTEMS.

To the Editor:—I am interested, and somewhat entertained as well, by the letter from your correspondent, "J. N. G., Georgia," in the February issue of your journal, and the response thereto by Mr. H. P. Clausen. As the originator and patentee of the "artificial ground and compound metallic circuit system," which I devised under the spur of necessity, for the purpose of affording immediately needed protection to my telephone exchange systems from the destructive leakage from the rapidly extending strong current plants, I feel that I can speak authoritatively as to the best manner of installing such a protective device—especially, as I did not apply for a patent or make my invention public until I had given it many thorough experimental and practical tests. "J. N. G." will doubtless allow me to suggest that he is in error in ascribing the interference his exchange is experiencing from the electric lighting system, to "induction." My crucial experiments and extended experience convince me that induction proper acts only at comparatively minute distances, depending to a great extent upon the condition of the atmosphere, the pressure and volume of the inducing current, and the resistance of the respective conductors. The telephones will not be sensibly affected by induction from an electric light or power current carried by wires on poles or fixtures located on the opposite side of a street from the telephone wires. The phenomenon of induction manifests itself only when a distance of a few inches, or at most a few feet, intervenes between the conductors of the two circuits. Unless therefore the telephone and electric light wires are very improperly and dangerously massed on the same poles in intimate association and parallelism, our friend cannot justly lay the blame of his troubles on "induction." If he will ascribe his ills to "leakage" he will come much nearer diagnosing the case correctly, and will be in a better frame of mind to prescribe the proper remedy.

Divesting our minds of all theories regarding "induction," let us consider for a moment the phenomena of electrical conductivity and resistance in the light shed upon the transmission of electrical force by that admirable mathematical formula enunciated by the famous German physicist, Ohm, commonly known as Ohm's law, which is generally accepted by electricians and scientists as the basis of the mathematical theory of electricity. According to this law, galvanic currents, or those manifestations of natural force which we call electricity, in their efforts to establish an equilibrium, will invariably seek not the *shortest* paths, but the paths of *least resistance.* This law is as immutable as the fact that in order to secure magnetic or chemical effects from a galvanic battery, or any other source of low tension electricity, we must establish a connection of some kind between the two electrodes, and these effects will be dependent precisely on the character of the conductors and their conductivity, or conversely if you prefer, their resistance. Therefore, as long as there is but one path and that of *unlimited conductivity* for a galvanic current to follow, so long will the entire output of the battery or generator be confined to the conductors forming that path. But there is no such thing as an illimitable electrical conductor. Even the huge mass of mother earth with her numerous veins of metalliferous ores, offers an appreciable resistance to the propagation of electrical impulses. Besides, there is no such thing known as a perfect insulator. Hence, for these two reasons, imperfect conductivity and defective insulation, it is in practice, found impossible to so thoroughly insulate a circuit that not even an infinitessimal portion of the current shall be able to leak over to adjoining conductors whose imperfect insulation and favorable relation offers additional facilities for their movement in strict conformity with Ohm's mathematical formula.

These facts will, I believe, readily explain why "J. N. G." does not experience satisfactory relief from extraneous current interference and cross-talk. He does not state whether his No. 12 return wire is iron or copper, but he would have trouble, though not to the same extent, no matter which metal is used. The leakage and cross-talk would be somewhat less pronounced with the copper return than it is with the iron, in precise relation to the difference in their conductivity. In short, there is too much resistance in his return wire to enable it to take proper care of the leakage currents and prevent them from spreading to the direct, or subscribers' wires it was designed to protect.

Did he have a No. 4 or No. 6 for his return, or even a No. 8, copper wire, he would doubtless experience perfect relief from both the leakage from the dynamo current, and the cross-talk from the other telephone circuits. With wire of abundant conductivity for the return, grounding that wire at a variety of points would make little or no difference in the result, but with wire of such low conductivity as he is probably using, he merely exaggerates

his troubles by offering an inducement to leakage currents that stray over the insulation and poles of both systems, to reach easily his return wire, and because of its limited conductivity it is unable to accommodate such leakages and they will therefore spread over the direct or subscriber's wires in their efforts to follow the various paths of least resistance that are open to them.

My preliminary experiments with the common wire return, led me to enunciate the necessity of the return wire exceeding in conductivity, at least tenfold the conductivity of any direct wire of equal length that was to be operated in connection with it, in order to secure a fairly satisfactory result; but to derive the greatest amount of protection from leakage of all kinds, I deemed it better to make the conductivity of the return wire twenty times that of any one of the individual wires attached to it. For the sake of the argument, we will presume that "J. G. N." is using a No. 12 copper wire for his return. I scarcely suppose he would attempt to utilize an iron or steel wire of that gauge. One mile of No. 12 copper wire B. & S. gauge, measures 8.44 ohms. Consequently, one fourth of a mile of the same wire will measure only one-fourth as much, or 2.11 ohms. The direct wires attached to this return are probably all No. 14 steel, which measures 75.03 ohms resistance per mile, one-fourth of which is 18.75 ohms per quarter mile. One-tenth of 18.75 is 1.87 (I discard the fractions), or .24 ohms *less* than the actual conductivity the return should have in order to secure even a fair result under the most favorable conditions. A No. 11 copper wire same gauge and same length, would measure 1.65 ohms. That would better fill the conditions, but a No. 10 or No. 9 measuring 1.31 and 1.03 ohms respectively would produce a still more favorable result.

For greater lengths, the discrepancy between the actual figures and those my theory indicates as being the minimum resistance that should be allowed in the return decreases. A half mile of No. 14 steel wire measures 37.51 ohms, while a half mile of No. 12 copper measures but 4.22 ohms. One-tenth of 37.51 is 3.75, which deducted from 4.22 leaves .47 ohm as the margin in favor of the common return. In a mile length of the two wires we will find the preponderance of conductivity in favor of the No. 12 copper return to be .94 of an ohm. As the advantage of the No. 12 copper wire increases steadily with its length when compared with an equal length of No. 14 steel, it will, under normal conditions, answer as a return for ay reasonable number of direct steel wires of the same length. But abnormal conditions are apt to obtrude at any time without a moment's warning. I have therefore always contended that it is a display of wisdom and true economy, to exceed the minimum theoretical requirements by at least one hundred per cent, making the conductivity of the return twenty times greater than that of any one of its direct wires of the same length. That proportion, or disproportion rather, between the conductivity of the return and direct wires, will provide for all reasonable contingencies, and will invariably protect the telephone circuits from interference from either leakage from extraneous sources, or cross-talk from companion telephone circuits.

A moment's consideration of the figures given above will show that as the length of the common return wire increases, its conductivity can be safely reduced without sacrificing its efficiency. In practice, I advocate the use of No. 6 copper wire for the first quarter mile from the central office, followed by quarter mile lengths of numbers 8, 10 and 12 copper in the order here mentioned, all B. & S. gauge. This for one mile of common return gives a total resistance of 4.77 ohms, leaving a safety margin of 2.73 ohms to provide for all contingencies. A quarter mile each of numbers 8, 10, 12 and 14, same metal and gauge in the order named, will give a total resistance of 7.51 ohms, but will leave a safety margin of only .01 ohm, which, however, will usually give a satisfactory result under normal conditions, and provided the return is properly installed. But I believe it is true economy to use the larger and more expensive wire and insure perfect relief.

A word as to the proper installation of the return wire. If copper wire of the requisite conductivity is used for the return, I am satisfied that it is a mistake to attach any ground connections to it. On the contrary, the return wires should be carefully insulated from the earth at all points, just like the direct wires. It is certainly advisable to throw as many obstacles as possible in the way of extraneous currents in their efforts to reach the telephone wires, as well as to prevent the leakage currents from the telephone circuits reaching the return, or the other direct wires connected to it. Hence the return wires should always be thoroughly insulated.

But it is still more important, in fact absolutely necessary that the return wires and the direct wires which they serve should preserve an absolute parallelism from end to end of the circuits. The direct wires must in no instance be allowed to separate from their individual return wires, but must always parallel them as perfectly as is physically possible, and on the same supports. And the common return wires should be located preferably on bracket and glass immediately beneath the lowest cross-arm. By allowing the direct wire to reach a station by one route and the common return by another, all the advantages of the latter are sacrificed, and the wire return might just as well be thrown out, and the earth return reinstated at once. Even a deviation of a portion only of a city block from parallelism, one wire entering the station from the front and the other from the rear, will destroy the efficiency of the wire return as a protector from the evil effects of extraneous currents. In one case I found it impossible to secure the proper degree of quietness on a subscriber's circuit while the direct or talking wire stretched from one pole to the building, and the common return was strung from the adjoining pole. The moment, however, I had the two wires span the street from the same pole to the building, perfect immunty from outside interference was secured.

In my "Reminiscences," now being published in TELEPHONY, I explain the manner in which I came to devise the wire return, and recite the trials and tribulations I thereby brought upon my devoted head. C. E. McCluer, Norfolk, Va.

The foregoing communication refers to an inquiry made by one of our correspondents in Georgia, who stated that he had installed 175 telephones upon a common return basis using a No. 12 return wire, the common return being run below the bottom cross arm and all joints being well soldered and all wires well insulated. The correspondent complained of electric light induction and cross talk. The editor's response suggested larger and more common return wires and as an immediate experiment advised grounding the present common return wire at different points in the system. The result of publishing the inquiry and answer has been to obtain the foregoing greatly appreciated expression from the inventor of the McCluer or common return system. The editor hopes that readers of TELEPHONY will send in their ideas upon this most interesting subject and thus permit of discussing the problem which "J. N. G." is required to meet.

A CLEVER TELEPHONE ARGUMENT.

THE Fort Worth (Texas) Telephone Company has hit on a clever and effective scheme to convince non-subscribers of the necessity of having an Independent telephone in their residences and places of business. A record is kept of the non-subscribers whom people try to call up over Independent lines, and a card like the one shown in the accompanying illustration is sent them, showing what they miss in not having an Independent instrument installed.

The card reads as follows:

Mr. Telephony Pub. Co.

No. 578 called you today and we were obliged to advise him that you did not have a telephone.

Do you realize that you are losing many connections by not having a Fort Worth Telephone?

FORT WORTH TELEPHONE CO.

LLOYD E. KNAPP, General Manager.

Ingenious ideas like that of Mr. Knapp will be found helpful in extending telephone business.

A BUSY TELEPHONE STATION.

THE busiest telephone pay station in New York City is in the basement of the Times building. It has more calls than any other single-position station, and its business is brisk from 8 a. m. to 1 a. m. of the following morning. There is an average of ninety-two calls an hour from the station, that is, a call and a half each minute during the busy times of the day. Often during the other hours there is an average of a call every minute. The total exceeds a quarter of a million calls per annum. This surprising showing is the outcome of only eighteen months' growth.

THE COMMON CAUSE

An Interesting Paper on the Canadian Telephone Situation, Read at the Iowa Convention.

By Francis Dagger.

HAD I been asked to select a subject for my remarks to you this morning, I do not know that I would have been able to choose one more appropriate than that which your programme committee has been good enough to assign to me. I cannot imagine any subject which should be of greater importance to Independent telephone men generally than that of "The Common Cause," and coming, as I do, from that part of Canada, where, probably, there are to be found more Iowa men than in any other part of the dominion, I feel that no more fitting addition to my subject than that of "International Interests" would be possible. Gentlemen, in congratulating you upon the marvelous record which you have made in the telephone development of your state, permit me to say that your labors here are already producing very tangible results in the province of Saskatchewan, which I have the honor to represent here today. Only last week I received a list of nearly 200 signatures from farmers, agreeing to take telephones in the event of the provincial government deciding to install a system in their locality. The majority of these men were settlers from your state. Again, the last interview I had in my office before leaving Regina, was with an Iowa man, relative to the incorporation of a farmers' mutual company, in another part of the province. I have, therefore, ample justification for saying that the future development of rural telephone service in Saskatchewan will receive a large impetus, as a result of the work which you have been engaged in during the past twelve years.

The province of Saskatchewan, like your state, is almost exclusively an agricultural community, the only difference being that we are, as yet in our infancy, while you have reached maturity. It was only in 1905 that Saskatchewan and Alberta were organized into separate provinces by the federal government, they having formerly been part of what was known as the northwest territories. The third session of the legislative assembly of Saskatchewan does not convene until the end of this month, so you will see the province is only two years old. Even at this early stage of its existence, the government has recognized the importance of establishing the telephone service upon a right basis. I have been engaged for the past six months in investigating conditions and am just about to complete my report, for the consideration of the government.

Dealing with telephone conditions in the western provinces of Canada, I am free to confess that the more one studies the local conditions, the stronger the conviction is impressed upon me that the problem is one full of difficulties, which require very careful handling, if we are to achieve the object at which we aim, viz., the greatest good to the greatest number. The problem is not rendered more easy, from the fact that in Canada the very air is impregnated with a desire for government ownership, many of the advocates of which, in their zeal for the cause, do not stop to discriminate between government ownership at any cost, and a rational government ownership, established upon a businesslike basis, which will secure to the people an efficient service at the lowest cost. Now, I wish to say here, that "government ownership at any cost," is just about as sensible as "peace at any price."

I have been twenty-six years in the telephone business, and have had special opportunities of studying conditions in all parts of the world, the result of which is, that, while I believe the ideal condition, from the public standpoint, would be that the long distance service should be owned or controlled by the governments, and the local services by the municipalities, I do not advocate government ownership of the whole service. I think, however, it will be admitted, that the long distance telephone service is becoming so important a factor in the life of the people, that it should be so controlled as to ensure to the community equal service upon equal terms to all. It would, in my opinion, be to the greater advantage of the telephone user if the same interests which control the toll lines did not own and operate the local exchanges. The strength of the Bell monopoly, for years in the United States, and in Canada today, can be attributed to the one great fact that its ownership of the toll lines have enabled it to control the situation. Had that ownership and control been vested in an Independent organization, having no interest in the local exchanges, conditions would have been very different, the local subscribers would have saved millions of dollars in telephone rentals, and would have enjoyed a more efficient service. Indeed, I very much doubt if there would have been any necessity for the Independent telephone movement.

I believe it is necessary that the long distance service of any state, province, or country should be owned and controlled by one interest, and inasmuch as it is not, from the public standpoint, desirable that such ownership and control should be vested in a private corporation, it is essential that the government should assume such ownership and control. I am convinced that if the long distance lines were in the control of the government the people would get a square deal in the matter of rates and service. Competition would then be placed upon an absolutely fair and equitable basis, and the evils of the Bell monopoly would disappear.

I believe that even in your great republic, the time is not far distant when this problem of government ownership of the long distance service will have to be seriously considered. Before the telephone users upon the North American continent can enjoy the full measure of the advantages which this great utility is destined to supply, facilities will have to be provided which will enable every citizen to have telephone connection, beyond the limits of his own town, with the lines of every local telephone system in every other city, town or village; over toll lines of standard efficiency, under conditions which will admit of no discrimination, and controlled by interests whose policy is not the creation of a monopoly, to satisfy the selfish interests of a few, but the maintenance of a system which will secure to the people an adequate service upon equal terms to all. I know of no other means of effecting this than by a similar policy to that which governs our postal system today; viz., government ownership. If you are to continue to retain the local control of your telephone systems, to which alone the success of the Independent telephone movement is due, I am convinced that the long distance problem will have to be tackled in some such way as I have outlined. If ever the Independent movement becomes weakened by consoli-

dations, such as the one which proved so disastrous in New York state, recently, it will be because of a continuance of the present policy in regard to the long distance service.

In what I have said I do not wish to be interpreted as being in any way antagonistic to private enterprise, for I believe the development of local and rural service will continue to require all the money and brains which the Independent movement can command. Further than this I am satisfied that private enterprise acting in harmony with the civic authorities is fully capable of furnishing a local service adequate to the most exacting requirements of the people.

Before leaving the subject of government ownership of toll lines, I should like you to note the great difference between the toll charges on this continent and those in countries where the long distance service is in the hands of the government. I have compiled a table showing the charges for sixty and 300 miles, respectively, for the countries named. They are as follows:

Country.	60 miles.	300 miles.	Average cost per circuit mile	No. of circuits on poles.
Australia	24½c	82c	$378.66	One
Belgium	19½	19½		
Gt. Britain	18	86	256.12	Five
New Zealand	12½		130.50	One
Germany	12	24		
Bavaria	12	24	105.66	Four
Switzerland	10	15	259.36 to 514	One
Denmark	9½	54	198.77	Three
Norway	9½	15	211.80	Two
Russia (56 miles)	26	62 (77c411 miles)	246.22	Two

I do not wish to make any comment on these figures further than to say that I think they justify the belief that if the toll lines were state owned, even taking into account the increased cost of operating on this continent, the charges could be very materially reduced. I may say, however, that in Norway, where you will note the toll charges are lowest, according to figures supplied to the Canadian government in 1905, the profit on the long distance system was $137,484 or 7.14 per cent on the capital expenditure. In Norway there are approximately twenty-seven government exchanges and 200 owned and operated by companies or private individuals.

In regard to the ownership of the local telephone systems I am satisfied that it is not in the interest of the people that a government should undertake to furnish this class of service. It may be necessary to exercise such reasonable control as will ensure efficient service over the toll lines, but beyond that I do not think any government should go. I have had an opportunity of studying the results of government ownership of the local telephone service, and I say emphatically that in no case has such a policy been to the advantage of the public. In all countries where the local telephone service is state owned, you will find a lack of development, and in comparison with Independent companies, on this continent, high rates and inferior service. The reason for this is, in my opinion, due in a large degree to centralized management, which in the telephone business has never produced the best results. I venture to assert that if some one large company in New York or Boston had started out in 1895 to compete with the Bell monopoly, it would today have existed only as a memory of the past, for the reason that its centralized management would have failed to satisfy local conditions in all parts of your union, and would never have secured the loyalty of the people. No system of centralized management, whether by government or private enterprise, will ever be devised capable of producing the results achieved in the Independent telephone field during the past few years.

A government, moreover, at all times is composed of the adherents to one political party. This fact in itself renders impossible that unanimity of loyal feeling in a local community toward its telephone system which is essential to its success, and to which is solely due the unparalleled record of the Independent telephone movement. While I do know of instances where a government owned local system has been closed out by competition with a company, I know of no case on record where a government has closed out an exchange operated by local enterprise, except by purchase. On this point I would direct your attention to Stockholm, Sweden, where the government has been in active competition with a local company for years, notwithstanding which the company had in 1905, the latest figures in my possession, 37,445 telephones, or one telephone to less than ten inhabitants. I would also add that while the last annual report of the postmaster general of Great Britain shows a profit on the long distance service, it also records a deficit on the local exchange business.

I have referred to these two phases of the telephone service in order that you may have some idea of the nature of the problem which we are endeavoring to solve in Saskatchewan. The government at this time, is committed to no policy. The subject is now receiving careful consideration, and the whole question will be submitted to the legislature at its forthcoming session, with the recommendations of the government. The matter is so important, in view of the fact that Manitoba has acquired the Bell system on our eastern boundary, and Alberta is pledged to complete government ownership to the west of us, that it is felt the policy decided upon should, as far as possible, have the unanimous approval of the legislative assembly. One thing I may say, however, and that is, the government is anxious to adopt a policy which will not only provide an adequate long distance service, but which will also facilitate the development of rural service throughout the province, and enable every farmer to enjoy the full benefits of this utility, at the lowest possible cost consistent with efficiency.

You will, no doubt, be the better able to appreciate the importance of this problem, to us, if I give you a few particulars regarding this great province and its future possibilities. Saskatchewan, I may say, is twenty per cent larger than Germany, and has the finest wheat growing area in the world. In 1901 the population was 91,500; today it is over 300,000. It is getting the lion's share of the influx of immigration into western Canada. Out of 73,937 homestead entries for the past two years in the three provinces, of Manitoba, Saskatchewan, and Alberta, 48,093 were in Saskatchewan. This means that the province is also getting a large share of the new population, in actual excess of the total of the two other provinces combined. Owing to the rapid extension of railways of the province, new towns are springing up in rapid succession. Within the next few years, it is believed there will be upwards of 500 towns and incorporated villages within 300 miles of Regina. In Regina, which in 1901 had less than 3,000 inhabitants, the population is now between 9,000 and 10,000. The fact that it is now the seat of the provincial government, which is erecting the magnificent legislative building, which you see a plan of here today, is a guarantee that it is destined to be one of the great Canadian cities of the future.

At present there are in the province approximately 3,250 telephones, 1,700 of which are Bell, and almost 420 miles of toll lines, of which 166 miles are Bell. I understand that if Saskatchewan was as well served, in proportion to its population as your state, we would have nearly ten times as many telephones, or 30,000. If I am wrong I should like your president to correct me. You will see, therefore, that we have much virgin soil, not only in an agricultural, but also in a telephonic sense, in our province. The farmers in all parts of Saskatchewan are wanting telephones, and I am confident that one result of the government's policy will be a rapid development of rural systems. Just

how this is to be best accomplished, I am unable at this time to indicate, but I know I shall carry back with me much valuable information, based upon your experience in Iowa, which will I am sure be of assistance to the government in determining its policy.

I fear you will think I have by this time forgotten my text. I understand that I am expected to refer to the "Common Cause." I would, therefore, ask what is the "Common Cause" so far as it relates to our gathering here today. In my judgment, its functions are the elimination of all the evils, wheresoever they exist, resulting from a monopoly of the telephone business. In order to accomplish this it has been necessary, for a large section of the community, to band itself together to secure for themselves those facilities which were placed beyond their reach by a selfish monopoly. Having invested your capital in securing these facilities, it became incumbent upon you to protect it, and in order to do so it was necessary for you to recognize the Bell monopoly as an enemy, and declare war against it. In this fight you have been successful and every day we see evidences of the victors' garlands strewn along the path of the Independent telephone movement.

I, like yourselves, for the past eight years in Canada, have been working to secure to the people better and cheaper telephone facilities, along different lines to you, perhaps, but still I have every reason to believe that my efforts have been productive of good results. Last year at the International convention, I prophesied that within five years there would not be a Bell telephone west of Lake Superior. That prophesy has been fulfilled already, in part, by the purchasing of its Manitoba plant; and today you find the president of the Canadian Bell, in his anxiety to retire from western Canada, telling his shareholders that he expected to sell the plants in Saskatchewan and Alberta to the respective governments, of those provinces, a statement which, so far as Saskatchewan is concerned, had no better justification than the apparent desire of the company to retire from the western field.

I have had an opportunity of surveying the field and I would in closing like to suggest a few thoughts which may be of value in the common cause.

The first thought is based on that somewhat hackneyed, but never to be discarded motto, "Union is Strength." I am pleased to see such a large assembly at this convention, but at the same time I am aware that there is room in your association for many more members. Now I wish to say that while union for the purpose of creating a huge financial trust, will be disastrous to the Independent cause; union which has for its object the forging of a mutual bond of your common welfare, pledged to protect and defend your separate and combined interests, is absolutely essential to the continued success of your cause.

The smallest telephone operator in your state or upon this continent will find time when he will need the help of the Independent Telephone Association. Even today he is reaping benefits which he otherwise would not enjoy, were it not for the pioneer work of such associations as yours. In my opinion no man has any claim to call himself an Independent telephone man unless he is a member of the association, and I am satisfied if he realized the true value of such membership to the interests he represents, he would not hesitate to enroll himself among your ranks. If I might therefore venture to make a suggestion to every delegate here today, it would be this: Get in touch with your neighboring company who is not yet enrolled upon the membership of your association; ascertain its objections to joining your ranks and do not rest until you have overcome those scruples and placed its name upon your membership roll. In this way every Independent telephone man has an opportunity to help you to close up your ranks, and present an unbroken front to the enemy.

Another thought I would give you is this: "If you sup with the devil you will need a long spoon." In other words, keep clear of entangling alliances with your competitor, the Bell. There are only two sides in the battle you are engaged in, viz., Bell and Independent, and he that is not with you is against you. No Independent man can, in my opinion, afford to have any dealings with his competitor, whether by interchange of service or in the purchase of equipment. Those who, in all honesty of purpose, perhaps do these things, will wake up some day to find out that they have been living in a "fool's paradise" and will discover that they have been furnishing their opponents with ammunition which they will not scruple to use with deadly effect, if ever they have the opportunity.

In Canada our association has taken a very strong stand on this point, and when I tell you that the Independent men over there are paying 27½ per cent duty on telephone equipment made in the United States, rather than purchase Bell apparatus in Montreal, you will see that they are in earnest in their determination in this matter.

Gentlemen, I have to thank you for the privilege of being with you on this occasion. I shall carry back to Canada not only a lasting remembrance of your courteous hospitality, but also a much clearer conception of the great work you have done to furnish the rural population of your state with those telephone facilities which were denied to them by an arrogant and selfish monopoly. Having spent a few days here, I know now why Iowa has more rural telephones than all the other states of the union. I hope that the time is not far distant when we in Saskatchewan will be able to make the same proud boast, so far as the rest of Canada is concerned. Of one thing, however, I am satisfied, and that is the more men you send from Iowa to settle on our boundless prairies, the sooner shall we reach that goal.

INDIANA CLEARING HOUSE PLANNED.

AT A meeting held at Fort Wayne the question of starting a clearing house for Indiana Independent telephone companies was discussed. W. L. Moellering, president of the second district association, presided, and E. M. Popp was secretary. The meeting was held at the Anthony Wayne Club where a luncheon was served those in attendance.

Routing and rates for long distance business were two of the themes which were under extended discussion, and a committee of one member from each county was named by President Moellering to issue maps of this and adjoining districts, showing all the Independent toll lines and indicating how the long distance business shall be routed. The same committee was empowered to deal with the question of rate adjustment. This is said to involve only isolated cases, some of which the telephone men believe should be reduced and others advanced slightly to establish a more uniform scale for the telephone service. It is also said that these rate adjustments do not contemplate any change in the general average of rates for long distance service.

In connection with the meeting there were many reports from individual companies, all of which showed phenomenal growth during the past year.

Among those present were W. S. Vivian, of Grand Rapids, manager of the Michigan Telephone Clearing House Association; John Coffey, Indianapolis; C. S. Willard, Lagrange; E. H. Roe, Ossian; J. A. Brown, Winchester; Dr. Parrish, Monroe; F. M. Schirmeyer, Decatur; W. H. Magley, Columbia City; D. M. Strouse, Auburn; John Emrick, John Simon and Frank Pulver, Huntertown; Fred Wilder, Angola; G. W. Beers, Fort Wayne; Frank Taylor, Lagro. The Fort Wayne companies were represented by W. L. Moellering, E. M. Popp, G. T. Fox and Martin Umbach.

MEETING OF M. W. & O. CLUB

Third Annual Gathering of the Millersburg, Wooster and Orrville, (O.) Telephone Company Operators.

THE third annual meeting of the M. W. & O. Club was held at Orrville, Ohio, February 14, and proved to be a most enjoyable affair. The M. W. & O. Club consists of the operators of the seventeen different exchanges of the Millersburg, Wooster and Orrville Telephone Company. The object of their annual meetings are to have all the operators, or as many as possible, get together for a day's frolic and become acquainted with each other. The company finds it a great help to the service, as the operators are more obliging to each other and have a friendly feeling which, otherwise, would not exist.

Members of Millersburg, Wooster and Orrville (Ohio) Club.

The 1908 meeting began with a banquet, which was served under the direction of Mrs. Schote, of Massillon. Following the banquet the president of the club, Mrs. Joseph Pomeroy, of Shreve, Ohio, introduced Miss Laura Heinig, of Millersburg, Ohio, as toastmistress. Miss Bess C. Wertz, the hostess, gave the address of welcome. The following were the toasts responded to:

"Receiver and Transmitter," Miss Bader, Holmesville.

"Induction Coil and Fuse," Mrs. Aylesworth, Fredericksburg.

"Bells and Batteries," Miss Crites, Smithville.

"The Ear," Miss Bott, Applecreek.

"Reading—Which is Better, Postmistress or Telephone Operator?" Miss Porter, Big Prairie.

"A Peep into the Future," Miss E. Limp, Millersburg.

"The Operating Room," Miss Marsh, Wooster.

"The Telephone," Miss Blanche Dunn, Shreve.

"Trials of an Operator," Miss L. Fowles, Glenmont.

"A Valentine," Miss Holderbaum, Wooster.

"History of Nashville Exchange," Miss Glasner.

Reading, Miss Houts, Rittman.

Poem, Miss N. Bryce, Orrville.

At 3:30 p. m. a business session was held, and the following officers were elected for the ensuing year: President, Mrs. Joseph Pomeroy, Shreve; secretary, Miss Emma Limp, Millersburg; treasurer, Miss Maude Ellsperman, Wooster. Mrs. Pomeroy kindly extended an invitation to the club to hold their next meeting at Shreve, which was accepted. It was also decided to change the time of meeting from February 14 to June 18, of each year. Other business matters were adjusted and the meeting adjourned.

A LARGER VIEW

A Paper Read Before the Iowa, Ohio and Michigan Independent Telephone Conventions.

By A. C. Lindemuth.

FOR ten years we have been building exchanges. Let us now build systems. For ten years we have been building rapidly and inadequately. Let us now build carefully and amply large. For ten years we have been building for an extensive and popular service. Let us now add to this a more careful consideration of finances and methods. For ten years we have been building too much for the present. Let us now build for the future.

There are three stages or periods in the history of the Independent telephone movement, or, rather, there have been two and we are now entering upon the third. The first period may be likened unto the "period of conquest," which represents the struggle with the Bell over the patents and which determined the right of the Independents "to live, move and have their being," in the telephone world. Unlike most revolutionary struggles, it was along purely legal lines, wise, just, persistent and forceful; carried on by the generous and voluntary contributions of the people and crowned with boundless success. Though a period of conquest, it was not for the acquisition of new territory, but for the recovery of the rights of the people. A popular revolt against the intolerable conditions of abominable service, discourteous treatment, exorbitant rates and ultra-conservative tendencies of an arrogant monopoly. We are sometimes criticized by the opposition for always speaking of them as the monopoly, but why should we be criticized when they themselves have always claimed and are preaching to-day more persistently than ever, that the telephone business is a "natural monopoly" and should be so owned and carried on? In its plan of organization, in the conduct of its business and in its beliefs and tendencies, it is as thoroughly monopolistic as any monopoly in the country. As contra-distinguished from the principles and policies of the Independents it was and is as diametrically opposed to them as two competitive systems could well be. There have been some evidences of late of a change of heart, but whether it be a change of principles or only a change of method is worthy of more careful analysis. There have been many changes before in the attitude of the Bell towards the Independents. These changes, however, have been principally in its methods of attack rather than in its aims and desires. It is to be hoped that the recent pretensions of our competitor are sincere and that the policy of "rule or ruin" so long pursued by it has been abandoned forever.

But the issues of that struggle over the patents were won by the people, and the Independent telephone movement at once started upon the second period of its history, "the period of development." This was the formative stage, during which the Independent telephone exchanges suddenly sprang up all over the country, but especially in the middle west; when scores of factories for the manufacture and sale of Independent telephone equipment and hundreds of firms for the supply of Independent telephone accessories appeared as if by magic, until there are, at the present time, no fewer than 10,000 Independent telephone companies operating approximately 20,000 Independent telephone exchanges in the United States and Canada, with tens of thousands of miles of toll lines, occupying in whole or in part all the states and territories of the Union and of the provinces of Canada, having over 4,000,000 of Independent telephones installed and being supplied by upwards of 1,000 factories and supply houses, and altogether representing an investment of over $350,000,000. All this has been accomplished in the short space of ten or twelve years. No such record as this has ever before been made by an enterprise in the commercial or industrial world.

It is true, gentlemen, in the building up of this wonderful industry or public service, we have made some mistakes. It would have been a miracle if we had not. Up to that time the Bell company possessed a monopoly of the telephone business and as a part of that monopoly it retained within its exclusive circles practically all telephone information. It has been wise unto cunning. No records, history or technical information inimical to its interests were allowed to escape to the public. For an employe of that company to be so enterprising as to furnish to the public prints an article on telephone subjects, however technical, meant immediate reprimand or dismissal from the service. We, the pioneers of the Independent telephone movement—and I say "we, the pioneers," because the enterprise is so young that only a few of the leaders have departed, the great rank and file being still here—were from all the various walks of life and necessarily inexperienced in the telephone business, but our hearts were right and we were courageous, progressive and public spirited, so that with "a willing mind there was a ready hand." Our aims were more patriotic than mercenary, and the great wonder is that so few and no greater mistakes were made. But such as they are, they should be corrected until our Independent system is as firmly established and made as financially sound as money and business acumen can make it.

During this period of Independent telephone development many important things were demonstrated, one of them being that the Independents could successfully construct and operate a telephone exchange, and also the fact that under the stimulus of sharp competition and by reason of the many fresh, bright and active minds suddenly enlisted in the cause and vigorously bent upon telephone construction and equipment, it has resulted in the extension, perfection and development of the art beyond the dreams of the old and unprogressive monopoly. Modern service, too, is equally as great a revelation over that of a dozen years ago as is the mechanism and capabilities of recent equipment over that of the old. It is but another instance of the great benefit to humanity of free and unhampered competition and of the induction of young, progressive and vigorous minds into any worthy enterprise. Great reforms in any sphere of life always appeal to the best and in this respect the Independent telephone movement was no exception.

One of our mistakes—if it can be called a mistake where no one was to blame—was in not being able to foretell the wonderful growth and possibilities in the telephone business ahead of us. As there never had been competition in the telephone business before, there was no criterion by which to anticipate its results. Hence, when we built for double

the capacity of our then known competitor, it was deemed an ample provision for an immediate increased service as well as for all reasonable future demands. A prediction of the results which actually transpired would have been regarded as the dreams of an illusionist. For, at the advent of the Independents into the field, ten or twelve years ago, the Bell company, after having had exclusive control of the business for about twenty years, had only about 300,000 telephones in the entire country, or less than the Independent companies now have in the state of Ohio alone. Under the stimulus of Independent competition, favored by its policy of popular rates and expanded service to village and rural communities, financed by local capital and managed and controlled by local citizens, the telephone business grew by leaps and bounds until within half the period consumed by the Bell the number of telephone users in the country increased twenty-five-fold, or to the enormous degree of 2,500 per cent. In view of this stupendous multiplication in telephone subscribers, which no one could in saneness anticipate, we, in most cases, builded too small and accepted a schedule of rates, fair and reasonable at the time, but which are not now commensurate with the cost and extent of the service. This inadequacy in rates should be readjusted. Not restored to the exorbitant demands of the old company, nor made unreasonable, but adjusted to a standard which will defray cost of maintenance and operation, pay a reasonable return on the investment and provide a reserve sufficient to renew the equipment when worn out or the limit of its capacity reached. No reasonable person, should object to this, and I have so much faith in the fairness and intelligence of the American people, that, when honestly and candidly appealed to, I believe the reasonable needs of all Independent exchanges will be favorably met. I know that it has been so in many of the towns and cities during the last year, and I have no reason to believe that the citizens of one community are less fair than those of another. And the people may well heed these appeals, for the benefits are mutual. They have profited immeasurably in the past, by the competition which the Independents have afforded and the continuance of that Independent competition upon a living and healthy basis is the only guaranty for their future protection.

This brings me to the third epoch of our development, which I have been pleased to designate as "the period of commercial success and supremacy."

It is true there is still some territory undeveloped and a few of the larger cities of the land unoccupied by the Independent telephone systems, yet if the policies contended for by the Independents are sound and if legitimate competition in the telephone business has proven a benefit to the people, then it is and can be only a mere question of time when all unoccupied territory, both urban and rural, will be fully developed. Its progress may be impeded for a time by unfair or unlawful means, or by an unscrupulous literary bureau and by appeals to the alleged interests and the prejudices of the people, but the Independent policy of extensive telephone service at reasonable rates has come to stay, and in the near future, we have all reason to expect, will prevail everywhere. In fact, if we may judge by the support which the people have given to the Independent cause, in the past, the benefits of Independent and legitimate competition have already been recognized and approved all over the land. Our investment is already greater than that of our competitor. We are supreme in the number of our patrons. In territory where fully developed, we generally excel in the extent and quantity of our construction, equipment and service, and there are no superiors anywhere in ingenuity and mechanical skill to those now enlisted in the Independent field.

This being true, I know of no good reason why any territory, however great or small, now occupied by the Independents, should be surrendered to the enemy, or why the policies of the Independents, which have proven so sound and so beneficial to the people in the past, should now be abandoned. Rather let them be more firmly established and their advantages more widely extended. Hence, I have adopted as the motto of this administration, *"The Integrity of the Independent Telephone System and Its Universal Extension."* This motto implies the continuing of the present Independent telephone system as a separate and distinct system, extended into all undeveloped territory whether in city or country, reorganized and strengthened into a complete and effective whole.

I am sure that this policy may involve the question of continued commercial and legitimate competition and whether such competition be beneficial. That this competition has proven most beneficial in the past has been both demonstrated and acknowledged. What changes of conditions have there been to reverse the rule? The best telephone minds of the country have given it most careful consideration and none is yet prepared to say that under present conditions the policy should be reversed. The only persons I have yet heard to question the advantages of legitimate competition at the present time have been employes of our competitor and a few laymen, who, finding it necessary to use the telephones of both companies have condemned it without having given the subject a broad and careful consideration, and who, I fear, are not altogether actuated by unselfish motives.

It is claimed by some that in telephone competition there is duplication and economic waste. In what business, pray, under modern civilization, is there not duplication and economic waste? From the railroad and telegraph companies, with their parallel lines and their duplicate machinery and organizations, to the grocerymen, the ice men and the milk men, who, with many unnecessary teams and drivers, crisscross each other's paths daily like a spider's web, we have duplication and economic waste. Can there be greater duplication and economic waste than here? What an enormous saving to all owners would it be if all the same classes of business of the country could be combined and all duplication and waste eliminated. And yet it is not done or permitted, to the end that trade may be unrestrained and not reserved to a favored few, and to the further end that the people may be served fairly and well, or in other words, that the people may enjoy good service at reasonable rates and without discrimination or favoritism.

And so firmly is the principle of legitimate competition established and recognized that all the powers of the federal government under the strenuous efforts of the President, backed by the people, have been and are being brought to bear to prevent any combination, coalition or merger among large corporated interests tending to stifle or destroy fair competition. The congress and the legislatures of the various states have passed stringent enactments against trusts and other unlawful combinations in restraint of trade. One of the most conspicuous candidates for the presidency, Mr. Taft, regarded it of so transcendent importance, at this time, that at the Ohio state convention only last week, he placed in the platform upon which he desired to go before the people, the short but significant planks, "commercial and industrial liberty" and "competition as against monopoly." In view of these things, is it not singular then that there should be those who advocate the destruction of competition in the telephone business and the monopolization of the service under one company?

The only possible unification of interest that could be thought of any conditions must be along the lines and under the protective policy of the Independent system. So whether there shall continue to be competition in the telephone business must be left wholly with our adversary, for the duty of the Independents is plain. It is "onward and forward" until our supremacy and the ultimate safety of the people are assured.

The Independent telephone companies having always recognized and approved regulation by law and cheerfully accepted all reasonable limitations to safeguard to public interests, they and they alone, can safely be entrusted to furnish to the public adequate and efficient service at reasonable rates in the absence of competition. Even without regulation of law, or the right to do so, this would most naturally be true, owing to the fact, that the Independent system is composed of local companies, officered, financed, managed and controlled by local citizens, whose interests are identified with those whom they serve.

Nothing could be more ill-advised at this time than for legislative or municipal bodies to undertake by law to force physical connection between, or a consolidation of, the Bell and Independent systems, and thereby stifle and destroy legitimate competition. Although such a connection or combination might prove beneficial to the competing companies, its result would inevitably be detrimental to the people by increasing the cost of service to the telephone using public, and in the equally inevitable deterioration of the quality of the service and a certain loss of all the many benefits which follow legitimate competition. Even if these things are to be brought about, it should not be by abrupt legislation, but through the natural evolution of fair and legitimate competition.

Let our aim, then, be the planting of the Independent system in all unoccupied territory whether city or country; the reduction of maintenance cost and depreciation charges by the best and most durable construction known to the art; the readjustment of rates along adequate but conservative lines; the adoption of the most approved business methods and a continuance of our recognized fair and courteous treatment of the public. The interests of the public and of the Independent telephone companies are one and it is for the common good that the Independent telephone movement should be strengthened and perpetuated throughout the land.

TELEPHONE LEGAL DECISIONS

A Compilation of Recent Decisions in Telephone Cases Rendered by the Upper Courts.

By G. R. Rossing.

[Beginning with this issue TELEPHONY will report in this department the recent important supreme court decisions affecting telephone companies and telephone affairs. This service will be complete and up to date, including all of the courts of last resort in the United States. Managers and attorneys of telephone companies will find this department a great time-saver, as by glancing over the decisions contained therein they can obtain in ten minutes information of late cases that otherwise would require research and study of law reports covering several days. Following the headline, briefly describing the case, is given the syllabus delivered by the court condensed into few words yet covering the point of law interpreted. The names of the litigants, the name of the court and the volume and page number of the law reports are appended.]

TELEPHONE COMPANY'S RIGHT TO USE STREETS.

THE power of a city council to regulate the disturbance of the surface of its streets and alleys as against telephone companies, being conferred by the legislature, is nondelegable; and hence an ordinance requiring every person making any "improvement * * * involving a disturbance of the surface of any alley, street or sidewalk of this city," to obtain a permit therefor from the city marshal if disturbance is deemed necessary, is void at least so far as it allows the city marshal to determine when permits are necessary.—*City of Texarkana v. Southwestern Telegraph & Telephone Company, Court of Civil Appeals of Texas, 106 Southwestern, 915.*

TELEPHONE COMPANY MAY MAINTAIN WIRES WITHOUT CITY'S CONSENT.

Under Sayles' Annotated Civil Statutes, 1897, Article 698, providing that corporations created to construct and maintain magnetic telegraph lines may set their poles, piers, abutments, wires, and other fixtures along, upon, and across any of the public roads, streets, and waters of this state so as not to incommode the public, a telegraph and telephone company may maintain its wires and poles in the streets of a city subject to municipal regulation as to location of poles and height of wires and obstruction of streets as provided by articles 702 and 426 and regardless of article 410, passed subsequent to article 698, giving city councils the exclusive control over the streets, alleys, and public grounds and highways of the city, and to abate and remove encroachments or obstructions thereon, since repeal by implication is not favored in law, and statutes are always so construed, if possible, that all parts may stand.—*City of Texarkana v. Southwestern Telegraph & Telephone Company, Court of Civil Appeals of Texas, 106 Southwestern, 915.*

LINEMAN'S DUTY TO TEST POLE BEFORE CLIMBING.

It is not negligence in a detail of superintendence, for which an employer is liable under the employer's liability act (Laws 1902, p. 1748, c. 600, § 1), providing for such liability for injury to an employe by reason of negligence of a person exercising superintendence, for a telephone company's foreman, when directing an experienced lineman to climb a pole and cut wires, to omit to tell the lineman to investigate as to whether detaching the wires will weaken the support of the pole, and to suggest that the pole be tested to ascertain whether it is rotten where it enters the ground, where such poles are first attacked by rot, and to inform him of the manner of making the test; such matters being as much within the knowledge of the lineman as of the foreman.—*La Duke v. Hudson River Telephone Company, Supreme Court of New York, Appellate Division, 108 N. Y. Supp. 189.*

LINEMAN'S CONTRIBUTORY NEGLIGENCE.

In an action against a telephone company for injuries to a lineman while working upon a defective telephone pole, the burden of proof rested upon plaintiff to show himself free from contributory negligence.—*La Duke v. Hudson River Telephone Company, Supreme Court of New York, Appellate Division, 108 N. Y. Supp. 189.*

REASONABLE CHARGE FOR SWITCHBOARD.

A telephone company may, in its discretion, purchase other lines and add telephones to its lines; and, where it becomes necessary to establish a switchboard and to em-

ploy a person to take charge of it, it may require every stockholder connected with the system to pay a charge of two cents on a message, though the directors, after the stock was purchased by complaining stockholders, passed a resolution that all stockholders should have free access to the entire line.—*McDaniel v. Faubush Telephone Company, Court of Appeals of Kentucky, 106 Southwestern, 825.*

TELEPHONE COMPANY HAS RIGHT TO PRESCRIBE REASONABLE CHARGES.

A telephone company is a public service corporation, required to transmit messages, if within its power to do so, with authority to prescribe reasonable rules and charges for conducting the business.—*McDaniel v. Faubush Telephone Company, Court of Appeals of Kentucky, 106 Southwestern, 825.*

ASSUMPTION OF RISK BY LINEMAN.

"An instruction that the burden was on defendant to establish assumption of risks incident to the employment, and that it was the duty of the master to provide a reasonably safe place, was erroneous, as confusing distinction between the assumption of risk of the employment and the specific assumption of risk by the plaintiff in continuing in the employment with knowledge that the defendant had failed to take proper precautions for his safety by providing against the danger of the pole being strained." For this error the supreme court of Iowa recently reversed the decision of the lower court, in favor of the defendant telephone company.—*Clark v. Johnson County Telephone Company, 114 Northwestern, 554.*

ACTION FOR INJURIES TO LINEMAN.

Where high tension wires had been used for ten years or more, and the insulation hung down in shreds, the jury had the right to find defendant's negligent, on evidence that plaintiff, telephone lineman, was thrown off his guard by his foreman, replying to the question, "How about rubber gloves?" "Go ahead; you don't need any."—*Dutcher v. New York Telephone Company and Rockland Electric Company, Supreme Court of New York, 108 N. Y. Supp. 567.*

CITY CANNOT IMPOSE ADDITIONAL BURDENS ON TELEPHONE COMPANY.

When an ordinance of a city has invited investments and expenditures, which are made in good faith and in reliance upon it, the city authorities, if the use be a public one, cannot arbitrarily impose by subsequent regulations, without necessity or the demands of public convenience, additional burdens upon the company which are clearly beyond the reasonable exercise of the police power.—*Plattsmouth v. Nebraska Telephone Company, Supreme Court of Nebraska, 114 Northwestern, 588.*

INJURY BY FALL OF TELEPHONE POLE.

Where a servant who was injured by the fall of a telephone pole on which he was working, occasioned by the strain of ice covered wires, negatived in his petition that the risk was one assumed by him as incident to his employment, in a general way, by alleging that the conditions and dangers were not known to him, which was met by a general denial, the assumption of risk incident to the employment was sufficiently presented by an instruction that such risks meant risks which the law holds that a servant assumes, which are necessarily incident to the employment, and which are reasonably incident to a proper discharge of his duties.—*Clark v. Johnson County Telephone Company, Supreme Court of Iowa, 114 Northwestern, 554.*

RURAL TELEPHONES DOWN SOUTH.

THE wide extension of rural telephones and their recognized value are well understood in the northern states, but south of Mason and Dixon's line the farm telephone has developed comparatively slowly. The following extracts from an editorial in the Atlanta (Ga.) Constitution, however, show that in the south, as in the north, the farm telephone is making rapid headway:

"How many farmers know that practical modern genius has made the telephone infinitely cheaper and just a little more indispensable in the country than in the city? They have been inclined, in the south, to regard the 'voice of the box' as essentially a city institution or, at best, as one of those helpful luxuries of life open only to the rich man who is capable of maintaining a costly establishment in the rural districts. But now the man in the country can enjoy the advantages of instantaneous communication with his neighbors and the outside world with vastly smaller expenditure and on much easier terms than the man in the city. The fact is relatively new and it has been slow in spreading throughout the southern states. In New England and the middle and western states, however, the rural telephone, with long distance connections, is as commonplace and indispensable a factor in daily life as the school, the church or rural free delivery.

"Under a system which has been in successful operation for a long time, the individual farmer, regardless of his distance from a telephone town, can, by co-operation with his neighbors, install an instrument at a cost of something less than 50 cents per month. This sum is within reach of the man of the most modest means. The resident of the city is taxed anywhere from $2.00 to $5.00 a month for identically the same privileges. When a sufficient number of farmers to justify the expense of wires and installation in a given territory have reached an agreement—twenty-five, as a rule—the instruments are put in place and the automatic system begins its operation. The lines are maintained at a trivial outlay. These local, independent systems also make connections with the long distance telephone. At any moment, the rural patron may, by giving the proper notice, be placed in communication with New York, Chicago, Atlanta or any point reached by the comprehensive systems now in existence and constantly spreading.

"Under these conditions the telephone in the country is no longer a luxury. It is a cheap and an almost indispensable necessity of the daily routine. People live close together in cities. They have the advantage of street cars and of pavements that are passable in all kinds of weather. In case of sickness, of fire or of any other emergency—in the face, indeed, of circumstances that rise in everyday, normal life—they can summon help or transact business with a minimum of delay. Until the advent of the telephone, none of these advantages prevailed in the country. There is no telling how many lives have been lost, how much money has been sacrificed, to bad roads, and slow, uncertain means of communication. This handicap is being effectually banished by the private telephone and its connection with the long distance systems. The history of these individual systems, wherever installed, is that their patrons, persuaded with difficulty to subscribe to them, would not, after a few weeks' trial, consent to their withdrawal. By making the country a safer, more pleasant place of habitation, and by placing it on a plane with the city, it is steadily increasing land values, while furthering educational and religious life. As the cheapness and the indispensability of the telephone is better understood, the south is being rapidly covered by a network of wires that will eventually penetrate the most remote of the rural districts."

Telephonic Reminiscences

By C. E. McCluer

THE first suggestion of a telephone exchange system came to me through the columns of the Scientific American. The idea was at once commended to my judgment as being a good one. I accordingly endeavored to keep in touch with the evolution of the telephone exchange system, and when I learned that the Western Union Telegraph Company proposed going into the telephone exchange business with the Edison transmitter and the Phelps receiver, the patents on which the company had purchased, I became imbued with a desire to establish an exchange in Lynchburg. Encouraged by District Superintendent J. W. Kates, I began to talk up the scheme, but soon found that it would require more time than I could conveniently spare from my managerial duties personally to solicit subscriptions. I consequently conceived the idea of calling a meeting of the business men of the city and attempting to secure support for the enterprise by the wholesale. I was then unacquainted with the fact that the American Bell Company of Boston (or wasn't it at first styled the National Telephone Company?) had just begun exploiting the southern states and was even then working up exchanges in several southern cities with a view to equipping them with Bell receivers and Blake transmitters on which the company held the domestic patents, or I might have taken a less public course with my enterprise. As it was, I obtained the consent of the proprietors for the use of the Arlington Hotel reading room for my meeting, and advertised it for several days in advance in the local newspapers.

On the afternoon of the day appointed for the public meeting, I was called on by a gentleman who introduced himself as James M. Orms, an agent or representative of the Boston company, who requested to be allowed to attend my meeting that night and present the claims of his company. Not having been posted as to the competition that had already begun between the New York and Boston electrical organizations, I had not looked for or counted on any opposition to my enterprise. I therefore at first declined to grant his request, but after reflecting a few moments I realized that it would be more generous, as well as the better policy, to meet his expectations with the same frankness which he had displayed in coming to me with such a request. I reasoned that compliance with his wishes would be less likely to give me trouble than a refusal, as I felt sure he could throw more and greater obstacles in my way by a private canvass than he possibly could by a public advocacy of the claims of his company. I have ever found that genuine frankness and an open and above-board policy in the exploitation of a legitimate enterprise, if it is to be conducted upon honorable principles, was more likely to establish confidence and command ultimate success than if prosecuted by methods that might be deemed questionable. I relied, too, on my well-established reputation as a man of business integrity to enable me to carry my point, feeling assured that my word would be accepted and relied on in preference to that of an entire stranger. I accordingly gave Mr. Orms a cordial invitation to be present, with the promise that I would give him an opportunity to talk to my audience after I had said my say.

The meeting was well attended, as I had advertised that I would explain the principle of the telephone, and the manner of operating a telephone exchange system. After my talk I introduced Mr. Orms as a representative of the "opposition," and gave him an opportunity of presenting the claims of his company. The upshot of the animated discussion that ensued was an agreement for a competitive trial of the rival telephones on experimental lines that we were each to construct between the two hotels, the Arlington and the Norvell House.

The wires were strung and the telephones installed, and for a period of six weeks all classes of citizens were given an opportunity to test the relative merits of the Edison-Phelps and Bell-Blake apparatus. Owing, I presume, not so much to the innate superiority of the Edison-Phelps instruments, as to the better construction of the line and more careful installation and maintenance of the telephones, the Western Union system was finally adopted by the citizens in another mass meeting assembled, and the exchange was eventually constructed and inaugurated by the Western Union Telegraph Company with the Edison-Phelps equipment. And this in spite of the fact that Mr. Orms cut rates on me at the last meeting, forcing me to reduce my original figures of $80 per annum to $48 per annum, the lowest rate I could secure from my company. Mr. Orms offered a business rate of $36 per annum. My rate of $48 was accepted in spite of the $12 lower rate offered by Orms, and the exchange service was inaugurated at the figures given above, $48 per annum. Our residence rates were put at $36 per annum, while the opposition went down to $24 for residences. All rentals were to be paid quarterly in advance.

This unfortunate controversy resulted in much damage to telephone interests on account of the precedent established by the adoption of such low rates. Had not Mr. Orms foolishly endeavored to beat me by such fearful rate cutting, and had the original Western Union figures been established, the Southern Bell company would have been spared much criticism and trouble afterwards when it found it necessary to increase its rates. About the same tactics were adopted by the representative of the Boston concern at Richmond, Norfolk, and other cities of the south where exchanges were attempted to be established before the cessation of hostilities between the two great electrical organizations, with the same result experienced at Lynchburg, the adoption of non-paying rates.

The Bell-Blake apparatus was unfortunate on account of the fact that no one associated with Mr. Orms possessed electrical knowledge or telephone experience. Mr. Orms himself admitted to me, just after my public dissertation upon the principles governing the electrical transmission of sound, that he had never understood the operation of the telephone till then; and his "electrician" (save the mark!) accidentally broke one of the carbons of his Leclanche microphone battery and took it to a repair shop to be riveted together, maintaining stoutly, when the shopman told him it could not be done, that it was cast iron! In consequence of this inefficiency on the part of his subordinates, the Bell-Blake instruments were neither properly placed nor properly cared for, with the inevitable result that they suffered in comparison with the better installed and more carefully tended Edison-Phelps telephones. Up to that time the telegraph people had looked askance at the telephones and but few, if any, would have anything to do with them. The consequence was that the National, or American Bell, company had to depend on inexperienced

and untutored men to fill subordinate positions, while the Western Union authorities were able to command the services of men who possessed the superior advantages of practical electrical experience.

At this time, and for some time after the opening of the Lynchburg exchange, the Western Union and the American Bell companies were active competitors in the telephone field and bitter litigants in the courts, the Bell people—rightfully, as I think—claiming that the Phelps receiver was an infringement of the Bell patent, and the Western Union authorities just as stoutly and as truthfully holding that the Blake transmitter infringed the Edison battery transmitter patent. Mr. Orms, representing the Bell interests in the territory south of the Potomac, pursuing the same tactics elsewhere that he had adopted in Lynchburg in order to head off the Western Union enterprises, reduced his rates almost universally to $24 per annum, or less. Meeting with some success and starting several small exchanges at those ruinous figures, he soon made the unwelcome discovery that his operating expenses exceeded his income—in fact, that he had, figuratively, put his foot into it clear up to his ears. He therefore decided that he must veer around on another tack. But, having begun at non-profitable rates, he found it difficult and hazardous to enforce an increase, and wisely realizing that the more business he secured at the low rates the worse he was off financially, he returned to Boston, and, as I have been told, after vibrating back and forth between that "hub of the universe" and the "empire city" for some weeks, succeeded in bringing about a truce between the two electrical giants, and eventually the execution of the famous contract, under the terms of which the Western Union surrendered its telephone patents to the Bell company and retired from the telephone field. In return for which, "they do say," the Bell people covenanted never to encroach on the "telegraph" preserves of the Western Union. The cross-fire legal contests were accordingly declared "off," and the great octopus entered upon its long and prosperous career as a telephone monopoly of the first water.

The first intimation I received of any change in the telephone situation was the reception of an unexpected and unwelcome order from Superintendent Kates to prepare the minds of my telephone patrons for a change in station equipment, from the victorious Edison-Phelps to the condemned and rejected Bell-Blake apparatus, that had originally been tendered at rates considerably lower than those the Lynchburg public had elected to pay for the Edison-Phelps outfit. And not a word was said, mind you, about the subscribers being given the benefit of the lower rates offered by Mr. Orms, in consideration for the change in apparatus!

Here was a pretty kettle of queer fish! How was I ever to wriggle out of it? I had labored earnestly and laboriously to convince my telephonic constituents that the Bell-Blake apparatus was simply "not in it" with the Edison-Phelps, and had proved my contention by both argument and practical illustration as certainly as a problem in mathematics; and now to be so suddenly confronted with the necessity of turning right around and proving just as flatly and conclusively that in very truth the Edison-Phelps devices were not worthy of being mentioned in the same connection with the Bell-Blake inventions, and that I had lied to a confiding public, both in word and action, was simply exasperating and—stultifying. My conscience, however, was perfectly clear. I had not intentionally deceived. I believed every word I uttered, and was persuaded that I did exactly right to warn the public against the Bell-Blake telephones, and persuade them to adopt what I honestly believed to be the better grade of goods at the higher price.

I begged and entreated to be allowed to retain the Edison-Phelps installation, explaining what an unhappy position I was placed in, and the difficulty I would experience in attempting to satisfactorily explain to my subscribers the necessity of replacing the approved and highly appreciated Western Union apparatus by the rejected, despised, and inefficient Bell appliances. But all to no purpose. My appeals fell on deaf ears. No exception could be made in my favor. My Edison-Phelps pets were doomed to utter annihilation. They had belonged to the despised and hated Western Union conglomeration, and, like the cast-off habiliments of a smallpox patient, must be purified, and the inoculation of a poisonous virus, and the danger of contagion eliminated by fire! I was in about the same unpleasant predicament of a judge of a legal tribunal who is compelled to reverse his own formal decision, or a prominent politician trimming sails for an "about ship" maneuver under the compulsion of a sudden and universal change in public opinion. I obeyed instructions, though, with the best grace possible, but there was universal kicking, and my reputation for veracity and the possession of good judgment suffered to some extent; and it took several months and a lot of "eternal vigilance" and super-excellent service after the changes in the subscribers' station apparatus had been completed to reconcile my customers to the new conditions, and to induce them to admit that the Bell-Blake telephones were not so bad as I had pictured them. I was in the position of the fellow that wanted to sell the tanner a dogskin and laid especial stress on the fact that the dog was very fat when killed, until the tanner assured him that the skin of a fat dog was not nearly as valuable as that of a lean dog, when the anxious trader reluctantly admitted that the dog "was not so d—d (that's my abbreviation for "darned") fat after all." After my severe criticism and ridicule of the Bell-Blake telephones, and my confident and generous commendation of the Edison-Phelps brand, it was somewhat stultifying to be compelled to face about and admit that the Bell-Blake apparatus was not so bad after all. But I did it. I swallowed my leeks like a little man, and soon vindicated my judgment by proving that it wasn't so much the quality of the apparatus as the qualifications of the man who exploited them, that insured success. Joint debates, public discussions and competitive trials are good things in their way, but before engaging in such pastimes it is the part of wisdom to make sure of one's ground. Be morally certain that your position is permanently tenable, and that you are going to be a fixture on the selected side of the stream. You can't always tell when there may be a possibility of your wanting to wade across to the other side without getting your feet wet and catching cold. I was at that time comparatively young and unsophisticated, in spite of several years' residence in the commercial and political (democratically speaking) metropolis of the country, and had not learned the devious ways of politicians and capitalists, nor discovered that he who puts his faith in either leans on a frail reed that is likely to break at any moment and pierce his hand, if not his vitals.

I trust the reader will bear with me patiently when I occasionally wander from my subject to recount various and sundry bits of personal experience outside the telephone enclosure. They are injected into my "ower true tale" by way of illustration and relief, and were woven into the woof and warp of my business character and moral disposition, just as are the colored threads that make up the general ensemble of a completed fabric.

While living in Lynchburg I completed my education, by graduating with flying colors from the Lynchburg Female Seminary. I have often mystified my lady friends by asserting that I finished my education in a female boarding school. One very pretty school girl en route from the Mary Baldwin Seminary, at Staunton, Virginia, to her home in Tennessee for her vacation, with whom I struck up an acquaintance on the railway train that was bearing us to the southwest, was so wrought up by curiosity to know how I accomplished the feat, that, rendered impatient by the with-

holding of particulars, she could wait no longer, but blurted out in the most innocent manner, "Did you wear girl's clothes?"

It was the same school to which I alluded in the first part of this veracious history, presided over by my mother's old-time friend, Mrs. J. B. Ramsey, who had known myself and wife when we were children. Having more space in her seminary than was necessary for the accommodation of her boarders, and learning that we were looking around for a suitable boarding house (having decided to decline housekeeping after some six or eight years' experience in a little "dove cote," as our friends were pleased to call it, in which we had installed ourselves immediately on returning to Lynchburg from our wedding trip), Mrs. Ramsey offered to give us a suite of rooms with table board at very reasonable rates, and we gladly accepted the offer and were soon snugly ensconsed in our new quarters, which we occupied three years very happily and pleasantly. At the beginning of the third session of the school, after we had become domiciled under its roof, I learned that it was the purpose of Mrs. Ramsey's associate principal, a Mr. Edmunds, a graduate of the University of Virginia, to start a class in chemistry. That was a department of science in which I had ever been intensely interested, but into which I had never had an opportunity to delve; so I at once asked the privilege of joining the class, which was readily granted, and I was regularly enrolled with the rest of the girls (!) as a pupil. As an argument in favor of the co-education of the sexes, I may say that my presence in the class produced a spirit of emulation among the members that resulted in the chemistry class taking the first position as to recitations, attendance and proficiency. The young ladies vowed that I should not outstrip them in scholarly standing, and determined to prove that the female mind was just as capable of receiving higher education as was that of the male. And they did it, too. Some of them were ahead of me, though I was not at the extreme foot of the class.

I never failed to appear at the hour for the daily recitations, although I always charged that Mr. Edmunds, with a bias in favor of the young ladies, usually gave me the hardest questions to answer and the most complex problems to solve, and figuratively made me "toe the mark." Saturday afternoons we generally spent in the laboratory engaged in experiments and chemical researches, in which I was required to manipulate the chemicals and apparatus and handle the explosives. But I derived, if possible, more than my due share of the benefits flowing from the practical experience thus gained during our chemical investigations, that has often since then been of service to me.

One of the young ladies of the graduating class of that session, between whom and my wife a warm attachment had sprung up, begged me to write her graduating essay for her, vowing that if I did not, she would make no effort to secure her diploma, an essay being a *sine qua non* to that end. I positively refused to be a party to such deception and did all I could to induce her self-willed ladyship to undertake the preparation of the essay herself, knowing she was perefctly competent for the task, but offering to aid her in every way possible short of its actual composition. But she was resolute, and at the last moment, when my wife had by entreaties been induced to intercede with me in her behalf, I exemplified the inherent weakness of masculinity by acceding to her entreaties. Being musically inclined withal, my flute and voice were brought into requisition when preparations for the commencement exercises that marked the end of the session were begun, and I faithfully practiced my roles and attended rehearsals for several weeks preceding the closing exercises of the school.

I accordingly took part in the academic exercises, not only by preparing a graduating essay, but by reading it before the assembled pupils and a large audience of their relatives and friends, in abject obedience to the small tyrant who laconically decreed, "Now that you've written it you shall read it also." My flute and voice (not my flute-like voice—it is more nearly akin to the bassoon family!) during the concert also mingled with the harmonies evoked by the quartette of pianos under the delicate and skillful touch of the graduating misses, and with the vocal set pieces and choruses. I kicked feebly because Mrs. Ramsey refused to grant me one of the coveted diplomas. But she based her refusal on the fact that while I had *read*, I did not *write*, a graduating essay, and I did not dare to undeceive her, though I am sure that Mr. Edmunds suspected the subterfuge of which my little friend and myself had been guilty but he evidently kept his own counsel, as we both got away without being arrested and put in the postoffice.

In those halcyon days I emulated old Dan Tucker, who the plaintive ballad says:

> "Played on the fiddle and sang in the choir,
> And nobody else could sing louder or higher."

Only my fiddle chanced to be a flute (that was before I tortured my family and all the neighbors within a half mile, by learning to play the clarinet) and my voice a failure. But I nevertheless had the nerve to officiate and sing in our church choir. At one time we enjoyed the organ-ic ministrations of a mighty sweet little lady who, besides being a good musician and reader and an adept at handling a pipe organ, was extremely bright and ready witted. She and I several times crossed swords in good natured wordy combat, but so quick in verbal "parry and thrust" was she that I was always worsted in the encounter; but, like the poor moth, attracted by the brilliancy of the fair demoiselle, I was constantly returning to the attack only to meet with repeated discomfiture.

One Sunday morning our pastor, Mr. Hall, during the course of his sermon found occasion to reflect rather uncomplimentarily, not by name, but indirectly, on Henry Ward Beecher, then in the heyday of his extended notoriety. Turning to the young organist, who was sitting near me, I whispered:

"Mr. Hall better mind how he abuses Henry Ward Beecher. He baptized me."

Quick as a flash came the cutting rejoinder, also in a whisper: "That accounts for you being such a grand rascal!"

Quite naturally I subsided. Although conscious of the fact that the only grounds the young lady had for her quick "retort courteous" was that I was by nature of a cheerful disposition, and inclined to tease and make merry at the expense of my friends. My rascality was always of the harmless variety—if I may be allowed to say so myself!

Perhaps, I had better explain that on the date of my birth, in 1836, and for some years thereafter, Henry Ward Beecher was the pastor of one of the two Presbyterian churches in Indianapolis, Indiana, of which my parents were members. It was quite natural, therefore, that Mr. Beecher should have been selected to christen me. At that time, however, he was just entering upon his eventful career, the Indianapolis church being his second charge, Evansville, Indiana, having been the scene of his induction into the ministry. From there he had been called to the state capital. It must have been in the early forties that Beecher's anti-slavery sentiments began to crop forth, and that he began his crusade against that peculiar southern institution. His church membership was largely, if not overwhelmingly, composed of Virginians and Kentuckians, Indianapolis having been mainly settled and peopled up to that date by emigrants from those border slave states. These southerners (among them my parents) warmly resented Beecher's unwarranted interference with an institution that they had been taught from childhood to revere and defend. The congregation was accordingly rent in twain, and nearly if not all of the southern members seceded from Beecher's church, which was presided over by a young man who sub-

sequently became well and favorably known as the Rev. Dr. Gurley, who for many years served a prosperous Presbyterian church in the national capital. Among my earliest recollections are circumstances connected with the Sunday school of Dr. Gurley's church, such as Christmas observances, and Fourth of July parades and celebrations, with the usual accompaniment of spread-eagle oratory for the delectation of the mental and spiritual man, and ginger-bread and artificial lemonade for the sustenance and refreshment of the physical organism. (Pray pardon my garrulity!)

The Lynchburg telephone exchange grew apace. Beginning with only twenty-five or thirty stations, within twelve or eighteen months it boasted nearly a hundred, and grew as rapidly in value, efficiency and popularity. My telegraph duties, which had always fully engrossed my time and attention, increased also, and I soon had my hands full to overflowing. But the telegraph company was reasonable, and allowed me all the additional help I actually required, so that I was able to devote some attention to my telephone duties, with the result that my subscribers were in the main satisfied with the service rendered them, and I gained some credit with the company as a successful telephone manager. When it therefore became necessary to accord Superintendent Kates some relief from his engrossing and laborious telegraph and telephone duties, he was authorized to employ an assistant to look after the telephone end of his bailiwick, and his choice—somewhat to my surprise—fell on me.

(Note.—But a few days after writing the last paragraph I was shocked to receive intelligence of the death of my long-time friend and generous benefactor, J. W. Kates, which occurred at his home near Richmond on the evening of the first day of the current year. We were intimately associated in business for many years at Lynchburg and Richmond, and ever regarded each other with feelings of mutual respect and esteem. Mr. Kates was the possessor of marked administrative ability, and was a talented and successful telegrapher and telephonist.)

Mr. McCluer's interesting reminiscences will be continued in the March TELEPHONY.

TELEPHONE DAMAGE SUITS

A Paper on Prevention and Defense of Damage Cases Read Before the Iowa Convention.

By W. S. Hart.

YOU gentlemen here, representing a business in which so much money is invested and upon which we are dependent for the most important and generally utilized public convenience of this generation, are naturally desirous of a familiarity with the reciprocal rights and privileges, obligations and liabilities between yourselves and the public and between you and the separate individuals constituting the public. Because of the recent and marvelous enlargement of your business and the unexpected fields into which it has entered, your rights and liabilities are not so clearly defined or easily ascertained as your legal advisers could wish for. You are now entirely without law upon many matters with regard to which you may expect legislative action in the early future, and are hampered by some laws obsolete and unadapted to the business in its present stage of development. So, too, in judicial procedure, there is a paucity of precedent and of announced principles because legal questions of present frequency arise from conditions so newly created that no court, at home or abroad, has ever been called upon to decide them.

Telephone litigation in the absence of revolutionary legislation will not call for the judicial discovery of new cardinal principles or of fundamental doctrine; the uncertainty and difficulty arises rather in the application and adaptation of time-honored doctrines and principles to the new and unlooked-for problems incident to your business. To illustrate: The fundamental elements of negligence will be announced in your cases in substantially the same words that they have appeared in railway machinery and municipality cases for generations back: the courts will seek for (and we hope will be fairly successful in finding) the same rules of construction in determining the scope and effect of your franchises and general statutory privileges that they have adopted for those of other institutions rendering general public service. In testing your liability for injuries sustained by your employes, the recognized master and servant rules will be announced and their proper application to your cases stated; and when your responsibility for the acts of your employes is in question, the elementary doctrine of principal and agent will have its application to the telephone service defined and limited. Confining myself to questions connected with your responsibility for injuries sustained in the highways, I shall address myself to this body without taking into account the fact that many of your members are themselves lawyers, and attempt to phrase my talk so that I shall not get beyond the range of information sought by clients desirous of being informed as to their legal rights and liabilities.

It may be that the telephone owners who are my clients have been more unfortunate in this respect than the average, but within the past two years I have been called upon to defend an even half dozen personal injury damage suits brought by individuals for injuries claimed to have been sustained from contact with, or because of down or broken wires in the highway, part of them being city wires and a part the wires strung along the rural highways. These cases so far have yielded nothing in the way of legal precedent as my client in each instance has escaped liability either by the favorable finding of a jury or a directed verdict by the court, and only one has been appealed to the supreme court and no decision has yet been announced in that case. Notwithstanding any former immunity you may have enjoyed, you cannot feel positive of not being confronted with such litigation at any time in the future. In fact, it is my judgment that such cases will be neither infrequent or unusual.

Under Section 2158 of the Iowa Code, you have a statutory right to occupy the highways of the state with your wires and necessary poles and other fixtures, and notwithstanding that the next section provides that you shall not maintain your fixtures so as to incommode the public in the use of the road, the judicial interpretation of the right of way section has been liberal and characterized by practical common sense. The unanimous declaration of all courts is that such a privilege constitutes a substantial right, and the prohibition against incommoding the public must

not be construed so as to be contradictory of and hostile to the section granting the right of way, but the two must be construed together, to the general effect that while your right in the highway is subservient to that of the public, the public cannot demand more than the exclusive use of what is necessary for its travel way thereon, and the use thereof for purposes of travel; and cannot interfere with or prevent your occupancy so long as you occasion no inconvenience in its use for the purpose for which it was intended.

Our own supreme court, in a recent case, although dealing directly with these two sections of the statute, has taken occasion to announce that a public service corporation, lawfully occupying a highway with its wires, is there by virtue of a positive legal right and cannot be interfered with so long as the ordinary, general and usual use of the highway is not obstructed and endangered.

It might be well at this time to mention the two separate constructions of the right of way statute when applied to public thoroughfares within the limits of cities and incorporated towns. The supreme court in the case of Chamberlain vs. Telephone Company declared that the words "public roads of the state," in Section 2158, meant every public thoroughfare—highways, streets and alleys—either inside or outside of corporate limits when used with reference to rights and privileges obtained prior to the adoption of our present code, July 4, 1897, but that since the adoption of the code, that provision in the right of way section is limited as to streets and alleys in cities or towns by the provisions of Section 776, which requires and provides for the granting of a franchise by the municipality as a condition precedent to the use of its streets and alleys.

From this it will be seen that in the absence of a franchise your right to the same privileges upon the streets of a town as you enjoy upon the country highways depends upon whether your lines were located before or after July 4, 1897. If before that date, your right is absolute. If subsequent to that date, you are a trespasser unless you have procured a franchise. This, of course, gives the earlier constructed lines a vast advantage over those belonging to newer organizations, and at times seriously handicaps and discriminates against new companies struggling for a foothold in the fields of powerful and well-established competitors. Various remedies by legislation have been suggested, but in my legislative experience and by my subsequent examination of the question, I have discovered no practical relief except by radical modification of Section 776 so as to repeal the franchise requiring feature, with reference to your business, and the jealousy of cities and towns towards any encroachment upon their streets and alleys or interference with their absolute control thereof renders such legislation extremely improbable.

I do not understand that the Chamberlain case undertakes to define the exact privileges of a telephone company having lines in a city or town prior to the adoption of the code, and I know of no other case in which the question has been considered, and it is my belief that on the authority of the Chamberlain case, telephone companies coming within the protection of the rule there announced have secured and are exercising much broader privileges than they are declared entitled to by the court in that case. But so long as there is no interference by city authorities and no new decisions expressly narrowing the privileges as now generally understood, telephone people need not worry, as they are having the benefit of all doubts and it is probable that legislation securing a liberal construction of that privilege would not be difficult to obtain in case the court should later announce a stricter limitation.

Returning again to the general proposition that you are in the highways with the legal right to the reasonable use thereof, the next question which presents itself is the rule of your responsibility for accidents occasioned by your wires or other fixtures thus in the highway. One rule can be announced with absolute certainty. You do not insure against and are not absolutely responsible for accidents or injuries from your wires and fixtures. In other words, you are liable merely because your wires or fixtures have caused the injury. The right of recovery depends upon whether or not you have been negligent or otherwise in the construction and maintenance of your lines.

To illustrate: You are not liable for the injury sustained by a traveler who drives into a telephone pole properly placed out of the beaten track, even though in the dark he might not know, or could not have known, that he was out of the track. You are not liable to the man who encounters and is injured by one of your wires unless there was negligence in the original placing of that wire, or unless your negligence permitted it to become a dangerous interference with the highway.

Although you are using the property of the public, you do not assume all liability arising from such use, and merely because you are in the highway, you are not required to guarantee either the public or an individual against injuries arising from the mere fact that your lines are in the highway. The fact that a person is injured by contact with one of your wires or poles does not of itself constitute a cause of action against you. In order to maintain a standing in court, the injured party must allege some fact constituting negligence upon your part, and to recover, he must prove these facts constituting negligence by a preponderance of the evidence. If he fails to produce competent evidence of negligence, the court will protect you by directing a verdict, but if there is testimony tending to establish facts which a reasonable man might find constitutes negligence, you are compelled to take your chances with a jury, both as to the fact of negligence and the amount of damages should they find against you on the question of negligence. I believe the lawyers of your body will agree with me in saying that the rule of your liability for injuries sustained in the highway is substantially the same as that of cities and towns with reference to sidewalks and of counties with reference to bridges.

You must in the original construction of your lines use first-class material of approved style and pattern, and sufficiently strong and suitable for the use to which it is put. The workmanship in the construction of your lines must be well and properly done throughout. Care must be taken that no poles, braces, guy wires or other wires shall be placed or left so that there is a likelihood or a probability of their interference with any person making ordinary, legitimate and proper use of the highway. It makes no difference in cases where injury was sustained because of careless and improper construction how long the condition existed or whether the officials in charge had notice thereof, or whether you foresaw the likelihood of the accident which in fact occurred; you are nevertheless liable because of the obligation upon you to build your lines of good material, well constructed, keeping in mind the superior right of the public to the use of all the highway that it requires. If you build a line wrong, or if you build it of poor or improper material, or negligently place your poles or guy wires so that there is danger of injury to those making ordinary and prudent use of the highway, you are bound to know the defects of what you yourselves do, and you cannot escape liability for the injury resulting from your own negligent acts.

The situation is different where the injury is occasioned by something occurring subsequent to the construction of the line and not due to faulty or improper original construction, misplacement of poles or wires or anything of that sort. Your obligation after you have once constructed your line is to use reasonable care and diligence and prudence to keep it in proper state of repair, and to do this, you are required to make such inspections and investigations as may

be necessary under all of the circumstances, and herein lie the questions of uncertainty upon which little light is given by judicial decisions.

A railway company maintaining a line of track costing thousands of dollars for its construction, over which it daily transports hundreds of human being and thousands of dollars' worth of property in heavy trains, pulled by powerful engines, moving at a high rate of speed, and earning for its owners vast sums of money, and upon which there is constant danger of accidents with disastrous and tragic results, is required to keep its tracks under constant supervision, and a failure to do so even for a period of a single day could well be characterized as negligence of the grossest character; but manifestly such a rule could not be imposed upon the toll lines of a telephone company, consisting of from one to a dozen wires, extending along a rural highway between towns eighteen or twenty miles apart, occupying only that part of the highway entirely outside of the traveled portion and safetly carried high in air, ten to twenty feet above the heads of all persons using the highway in the usual and ordinary manner.

Daily inspections of such lines, in some instances at least, would occasion an expense greater than the earnings of the property inspected, and might continue for months and even for years without occasioning any repairs or changes upon the property. It is safe to say that no court will ever impose such a requirement upon you as a condition of successful resistance to claims made for injuries by your wires falling down into or across the highway.

On the other hand, if your construction was originally insufficient, or if by reason of age it has become dilapidated and rotten, or if from failure to inspect your lines with reasonable frequency and failure to keep them in a first-class condition of repair, you should have reason to believe that your wires were liable to come down and interfere with travel, you cannot expect a court to release you from liability because they had only recently fallen and you had no knowledge of the specific danger.

While daily inspection is not required to relieve you from imputation of negligence, you are required daily and hourly to make use of such means as are reasonably convenient to ascertain and know the condition of your lines and their freedom from liability to inflict injury. For example: if in ringing between two towns it is manifest that there is some interference or that a wire is grounded, you are compelled to anticipate that the wire may be down in the highway or that there may be some condition along the line constituting a danger to the traveling public, and unless you take prompt steps to ascertain the exact cause of the trouble and replace the line in its proper condition, you must expect, in case of injury, to be held responsible for the full amount of damage with the usual good measure accorded to corporations when being dealt with in such matters.

You are not liable for broken poles or down or broken wires (always assuming that your construction and general maintenance is reasonably sufficient) unless your employes have actual knowledge of the dangerous condition or unless it exists so long that you should in the exercise of ordinary diligence and prudence have known of the defect. The actual time during which a wire or pole may impede travel or interfere with the use of the highway without you being held to have notice thereof as a matter of law depends upon varying circumstances. Inspections of a line but recently constructed of the best material will not be required so frequently as it is of a line originally cheaply constructed and showing signs of age and decay. So far as I know, no court has yet specified the number of days or hours which must elapse after a wire is down in the highway before its owner would be liable for injury caused by it in the absence of actual notice.

The Alabama supreme court has said that the owner of a wire on a rural line, strung upon insufficient and rotten cross arms, was liable for the injury inflicted if it had been allowed to remain down in the highway for a period of two days. This, however, is not a test upon the question of time because the court would probably have said that the mere fact of the wire being maintained upon a rotten cross arm would render its owner liable, regardless of the length of time it was down in the highway.

In the state of New York, a storm-blown tree broke a telephone wire down into the highway, and on the next morning the road supervisor fastened the wire out of the highway to another tree, where it remained for four days, and then in some manner became unfastened and injured a party traveling on the road. Communication was not interrupted over the wire and the supreme court of that state declared that there was no liability upon the telephone company because it could not anticipate the blowing down of the tree, and the period of four days was too short in which to hold the company bound to know that its wire was down.

Last year I tried a case in the district court of one of the counties in this state where the poles had been reset and the line put back in apparent good condition on the morning of the 5th of July after they had been blown down during a storm on the night of the 4th, and the line had been twice passed over by a lineman in the performance of his duties during the ensuing month. Early in August an insulator pin was broken in some unknown manner, letting a wire down into the highway where a couple of teams became entangled in it, and it was then taken by a party living in the immediate neighborhood and fastened back to the pole at about the height of a man's head, where it remained for a period of five days, when in some unexplained manner it became loosened and swung out into the highway and injured a traveler, driving rapidly in the night time. The district court directed a verdict in my favor upon the ground that there was no notice that the wire was down, and the time was too short for the company to be held bound to have taken notice. In that case we proved by the operator at the nearest town that that line, with all others, was tested out each morning to see if they were in perfect order and free from grounding or interference. I find in resisting claims of this class, particularly for injuries alleged to have been received by coming in contact with wires in country roads, that there is great difficulty in procuring satisfactory and competent evidence with reference to the inspection of the lines prior to the occurrence of the accident.

My information is that very few toll lines operated by commercial companies are not inspected by a lineman, troubleman, superintendent or other employe, at least once each month and generally much more frequently. However, when suit is brought for an alleged accident, perhaps months after the occurrence, during which time little or no notice of it has been brought to the attention of the attorney, it is almost impossible to ascertain which employe made the last inspection, and to fix the exact date when he passed over the line and discovered nothing wrong, and I would make this suggestion that every employe whose duties require and render him competent to inspect and observe the condition of rural lines should be required to keep a pocket memorandum book in which daily notes should be made of the lines along which he had traveled, no matter whether his duty was one of inspection only or otherwise, and at the end of a year or other convenient period of time these books could be turned over to the superintendent to be kept until it was known that their use would not be required.

This would involve no additional clerical labor and no expense, and in the event of a damage suit, it would be of supreme importance to have a memoranda by an employe in his own handwriting from which he could positively testify that on a certain date he was over that line and found it in

perfect condition so far as could be determined by his inspection.

Another thought which has sometimes occurred to me is that it might be a good idea, particularly upon lines extending into remote neighborhoods, to arrange with some resident at the extremity of the line, and who had occasion to travel the road along which it was carried in going to and from town, to observe the condition of the line and report anything wrong discovered by him. This service could doubtless be obtained for a trifling discount upon the patron's telephone rental and it would be a powerful weapon of defense to be able to show that in anticipation of possible accidents, you had procured and arranged for frequent inspection of the wire.

Another point to which considerable attention is paid by courts in determining the existence of notice of a defective condition in rural lines is whether or not there was anything in the operation and use of the lines which indicated to the operator that there was some interference or grounding of the wire. My information is that when a wire is grounded, that fact with some idea of its location is usually discoverable from the difficulty in ringing through beyond the point where grounded, and it would be a wise precaution to adopt the system of having the operator at central points each ring out and test the working of the wires by the ringing, and communicating with the operator at the other end, with the special object of ascertaining that the wires were not grounded or down. A record could be kept of these tests in a book, where an "O. K." check mark could be placed after each wire for each day of the year. Then if suit should be brought for an injury occasioned by one of these wires, and the plaintiff was supported, as he usually is, by the testimony of the entire neighborhood to the effect that the wire was down or some other dangerous condition manifest for indefinite periods which their prejudiced and unverified recollection may fix at anywhere from a week to a month prior to the accident, you would appreciate the importance of having a witness who could come upon the stand and testify positively that on the very morning of the accident she had tested that wire and found no indications whatever of any defective condition, and had made a record of such test, from which she knows positively that she is not mistaken as to the date or the wire.

A wire cannot be down in a highway for twenty-four hours without furnishing material for abundant and apparently credible testimony that it was down anywhere from three to thirty days; and that too without any wilfully false swearing on the part of plaintiff's witnesses. They depend upon recollections that are faulty and conjectural, and which are often colored by their sympathy for the plaintiff. The recollection of one witness will be that the day of the week upon which he saw it was Friday. Another will swear positively that it was on Tuesday. One will fix it as in the latter part of March. The recollection of another will be perhaps in the middle of April. And among them all there will be proof as to all days of the week and very likely for all the days of an entire month, and it is for that reason that I strongly urge upon you to adopt such means as your experience will indicate as the most convenient and accurate method of recording the exact date when your wires were inspected by your own employes; and also of testing out your wires every morning of the entire year, and keeping such a record of these tests that the operator can testify positively thereto.

I believe that if telephone men generally could agree upon the length of time which under ordinary conditions may with a reasonable degree of safety be allowed to elapse between inspections of their lines, that our courts would be inclined to adopt the opinion of yourselves with reference to that matter, as the most competent judges thereof. I have noticed in one reported case where the defendant telephone company showed that it had a rule requiring monthly inspections of all its lines, that the court instructed the jury that if such a rule was reasonable and regarded as sufficient to release it from liability; and in suits for damages sustained because of a fallen wire, if the defendant should establish the fact that it required inspection of its lines within stated periods, and that the inspection as provided by that rule had been made, and practical telephone men should come into court in numbers and testify that such rule was reasonable, and would under ordinary circumstances be sufficient to keep the wires in a reasonably safe condition, the attorney for the defendant would have reasonable ground for demanding a directed verdict because the plaintiff had failed to prove actionable negligence.

Courts are usually eager for competent information upon all technical and mechanical matters upon which they are called to pass. If this organization, acting officially through some committee or board of its members possessing special qualifications therefor, should formulate a set of rules for your own guidance in the construction of rural telephone lines; standardizing as it were, all parts of the work; laying down general rules as to the location of poles, construction, method of attachment and fastening of guy wires, carrying capacity of cross arms, material and construction of insulator pins, and method of attaching insulators thereto, and wires to the insulators, and every other separate detail of telephone construction and maintenance, including reasonable rules as to proper periods of inspection and general repairing; and in one of your meetings have the same incorporated into your proceedings and given the sanction of your approval, I would not be at all surprised to have courts of this and other states accept your official declarations upon each subject thus treated as their authority in determining questions of negligence, and non-negligence, with the resultant liability or non-liability, and you can readily see what a labyrinth of uncertainty and dangerous pitfalls you would avoid by having courts adopt your own definition of what constitutes sufficiency and safety in construction and vigilance in maintenance, instead of being left to the haphazard and often uninformed judgment of each tribunal in which you have to answer to a claim for damages, resulting in the majority of cases in the court shifting from it the responsibility and consigning it to the caprice and uncertainty of the findings of a jury.

This suggestion of mine, that courts would readily grasp at sound and reasonable declarations from an association such as this, is not without encouragement both in precedent and principle. Courts of every jurisdiction in the United States yield unqualified and absolute endorsement to the rules and regulations formulated by organized associations of underwriters even in matters dealing directly with your wires and those of other public service institutions carrying currents of electricity, and the tables and estimates both with reference to the probability of human life and the value of annuities and trust investments which are the result of the study and experience of life insurance experts, are received as competent evidence of the highest class in every court.

And why not, I ask you, should not your rules and your regulations adopted in good faith and for your own guidance and the conservation of the millions of dollars invested in telephone lines throughout the United States, and the protection and information of the public, whose best interests you are compelled to serve, be eagerly scanned by courts and judges as the truest and safest test upon doubtful questions involving the element of negligence?

I do not undertake to discuss this suggestion of mine. I am not competent to discuss it nor to determine its feasibility, but I commend it to your thoughtful consideration, bearing in mind that we are still in the formative period of judicial declaration as to what your obligations and liabilities are, and that for generations to come the tests which the courts are now being compelled to discover and apply to the

cases against you, will be authoritative precedent for all future claims. The importance of having the courts start right and establish precedents that will not permit piracy against you upon the highways, nor the confiscation of your property by holding you liable for conditions that are incident and peculiar to the ordinary conduct of your business, should not be overlooked, and if it is in your power to assist the courts in formulating safe and satisfactory rules and making proper applications of established legal principles, yould should not hesitate in doing your part.

The subject assigned to me was far too comprehensive for treatment in a single paper, and I have limited myself to the question of liability for highway accidents. A still more important and complicated feature of the subject is the class of cases growing out of the liability of transmission of deadly current to your wires from wires performing another function and occasioning fire or injury thereby. Still another subject for investigation would be your liability for the misconduct or negligence of your servants in the furnishing facilities for transmission of messages as required and demanded of you. Still another of especial interest has relation to your liability to employes for the injuries received by them during the course of their employment. Each of these separate subjects is well worthy of separate investigation by competent advisers and should be submitted at some future convention in separate papers.

OPERATORS' SCHOOL OF INSTRUCTION

A Valuable and Interesting Paper Read Before the Michigan Convention, March 25.

By J. P. Boylan

THE operation of a telephone school has within recent years become a prominent factor in the successful management of a large operating company. Too often have we realized in the past how woefully weak our system, or rather our lack of system, has been and how often we have been subjected to criticism from the subscriber that the new operator answering his telephone had blundered in giving him wrong numbers and had gotten things mixed up generally. The average subscriber was quick to learn that he was dealing with a new operator and a complaint to the chief operator would usually result in the moving of the operator to another position only to have her discovered and ousted at the request of some other subscriber. In time, however, the number of moves per day by the operator from one position to another would decrease as would also the assortment of cuss words from irate subscribers and the operator would step by step graduate into the ranks of the finished product. Then again there were numerous incidents of where new companies were wont to give as an excuse to the public for poor service rendered during the first few weeks that this was the natural result of a new company starting in.

With the coming of the operators' school all this was changed and unquestionably this new feature stands out most prominently among other progressive acquisitions as being responsible for the greatest efficiency in operating.

There has existed and still exists an erroneous impression that the telephone school is an added expense to an organization, a luxury, if you please, which could be dispensed with and something which ought not to be tolerated by an economical traffic organization. A careful analysis of the pay roll of a company, however small, having an operators' school as against a company of the same size without the school, will disprove the expense theory, without taking into consideration the many added advantages the school affords.

The question of operators here in Detroit resolved itself into one of two things. Either that of employing experienced operators or installing a school for inexperienced operators. The latter plan was decided upon for the following reasons:

First—The efficiency of a student after leaving the school will almost be equal to that of the so-called experienced operator because the phrases and mode of operation will be new to the experienced operator and it was believed that students would work up speed in operating nearly equal to that of the others.

Second—Experienced operators out of employment as well as those seeking a change are as a general rule undesirable.

Third—The other company on losing a number of operators would undoubtedly arouse public sympathy in their favor.

Fourth—Student operators would be paid $20 per month for several months after they entered the employ, while experienced operators could not be had for less than $25 or $27 and in some cases as high as $30.

We calculated at the outset to open our city exchange with a force of about forty operators. You will observe that the feature of economy looms up very strongly when one considers that the number of experienced operators at even as low an average as $25 would cost $1,000 per month as against $800 for the same number of school graduates at $20 per month. We fully expect to save enough in operators' salaries to pay for the student switchboard and all accessories in less than a year's time.

On March 15 we had on our pay roll forty-two operators and sixteen others varying from the chief operator to the messenger. The average operator's rate was $20 and the total average, including every employe of the operating department, was $21.77. The entire cost of our twelve-position student board, including four teachers' desks, amounted to something like $3,800. The reason for this figure being so low was due to the fact that only the necessary apparatus required for students' practice was installed and the balance was made up to represent in appearance only the regular switchboard.

While the complete multiple of 8,000 lines appears in each of the four sections only one per cent is represented in real multiple jacks, the strips of which are scattaered throughout the multiple. The balance is of the dummy type, but the imitation is so cleverly executed that few students have been able to tell the difference between the real and dummy jack until they have about completed their students' period.

Many colleges, especially those in the larger cities, have recently established preparatory classes with a view of having the student from the very beginning conversant with their system and mode of studies. This plan will appiy with equal force to training of telephone operators and our experience has shown that it is much more satisfactory in many ways to train a girl not having any previous operating

experience than to attempt to break a girl off of the many venial things which she has acquired elsewhere and which are not in keeping with our manual.

The students' switchboard is divided into four parts. Each part or section comprises three positions, the circuits of which are connected to a teacher's desk, the idea being to have one teacher in charge of three students.

The course of instruction is divided into twelve lessons, each lesson occupying one-half a day. Twelve students per week can be turned out of the school and if necessary this number can be increased to twenty-four a week by conducting an evening class.

We have deviated somewhat from the methods employed in other operating schools, in that charts are not used because they are as a rule not understood by the average student; neither are preliminary lectures given, because such talks necessarily have to do with the apparatus and mode of handling same, all of which at this time the student is unfamiliar with. It, therefore, follows that a lecture would not be comprehensive and at the best would only tend to confuse the student.

Before taking up the first lesson each student must undergo a test in eyesight and hearing. This is a very simple affair, the student being required only for the test in eyesight to read certain numbers on monitor plugs, also on several multiple jack numbers. For the test in hearing the teacher equips student with a regular operator's set and reads fifty numbers from the directory, requiring the student to repeat each number, the prefix and affix.

The students are then seated at the school board and given their first lesson, which is furnished them in printed form and comprises rules governing the student's conduct while on duty and in the building. This lesson also includes a simple explanation of the switchboard. The organization of operating room, including the various persons in authority in the operating department, is also explained.

The second lesson deals entirely with the multiple, and after same has been thoroughly explained to students the teachers will call off various numbers in order to practice for students, until they are able to find any number quickly.

In the third and fourth lessons other features are introduced and so on up to the twelfth lesson the student is instructed in something new daily and in this manner has no trouble in absorbing and retaining what she has learned. Actual practice in handling calls occupies much of the time after the fourth lesson. The last half hour of each lesson is given over to a review of all previous lessons, including practice.

The teacher in giving the student a call inserts a plug in jack at her desk, which lights an answering lamp at a student's position. The student answers the call in regular manner and the teacher, taking the place of a subscriber, calls for a number which is represented in the multiple by a real jack. As soon as the student inserts her calling plug in jack it will light a lamp corresponding to multiple jack on the teacher's desk. The teacher by inserting a plug in the jack under this lamp can put out the supervisory lamp on the student's calling cord, indicating to student that the called subscriber has answered.

The teacher by means of her cords has entire control of the supervisory lamps and can flash either lamp at will. By taking down the pair of cords at the teacher's desk both supervisory lamps on cords at student board will light, giving student a disconnect signal.

When the teacher calls for a number in a branch exchange the student, after answering call in regular manner, will switch in on a branch exchange order wire which is connected to teacher's telephone, the teacher in this case taking the place of the "B" or trunk operator at the branch exchange and assigning the trunk number for student. When the calling cord is inserted in trunk line at school a lamp is lighted on the teacher's desk in manner previously described. The teacher can either put the busy back signal on this trunk, when the student should report to subscriber or teacher that the line is busy or put out the supervisory lamp on calling cord, indicating to student that branch exchange subscriber has answered.

The teacher can put a busy test or out-of-order tone on any line on student's board and call for this line in order to test student on these particular features. In similar manner every conceivable circumstance or combination which might arise between a subscriber is thoroughly and effectively explained so that when the student takes her position on the regular switchboard she is never at a loss to know what to do in any emergency.

TELEPHONES IN MISSOURI.

THE state labor bureau of Missouri has completed the tabulation of statistics with reference to the telephone companies of the state. This is the first investigation of public utilities which has been made under the law passed last year providing for the compilation of statistics of these utilities. The report is for the year 1906. Fifty-five companies reported, including all the cities of the state, large and small and a few rural systems. It includes also the long distance companies doing business in the state. These fifty-five companies report a total of 91,426 telephones in use. Their capital invested is given at $7,805,086; receipts, $3,215,749; franchises are valued at $1,153,485. These are the only companies so far which have reported a franchise value to this department.

The new equipment for the year cost the sum of $2,022,439 which goes to the capital invested. For wages, a total of $1,818,941 was paid. For rents and taxes and royalties $224,222 was paid.

There were 1,878 male persons employed and 1,736 females. The receipts for long distance service amounted to $159,485. The price for the use of telephones for residences ranged from 50 cents per month to $4 per month. The price paid the female telephone operators range from $3 to $8 per week. There were 1,611, female operators employed during the year by these fifty-five companies reporting.

The labor department is now at work gathering and compiling statistics on water works plants and this will be followed by statistics on electric light plants.

NEW MISSOURI DISTRICT.

AT A meeting held at Boonville, Missouri, the Third District Independent Telephone Association, comprising the counties of Adair, Audrain, Boone, Callaway, Cole, Cooper, Howard, Macon, Monroe, Moniteau, Morgan, Saline, Schuyler and Randolph, was organized. The following officers were elected for the first year: President, H. M. Taliaferro, Boonville; vice-president, A. S. Purgin, Fayette; secretary and treasurer, C. E. Clark, Tipton; executive board of five, consisting of the president and the secretary, with Edward Cramer of Bunceton, L. M. Hayne of Nelson, and D. E. McArthur of Billingsville, Missouri.

About fifty telephone men were present, among them the following from the state association: Theodore Gary of Macon, former president of the International association; Houck McHenry of Jefferson City, president of the state association, and G. Y. Schweer of Windsor, member of the state board. The place of the next meeting will be chosen by the directors.

There are seven blind telephone operators at work in New York city. Six of them have been at work less than a year. The seventh, the first blind person in New York to become a telephone operator, is Miss Isaacs, who has been in charge of the switchboard at the Lebanon hospital for about two years.

THE MICHIGAN CONVENTION

Independent Telephone Men of the Wolverine State Hold Meeting in Detroit, March 24-25.

By J. E. Crowe

THE annual meeting of the Michigan Independent Telephone Association was held at the Hotel Pontchartrain, Detroit, on March 24 and 25. The attendance was the largest in the history of the association and great interest was manifested in the proceedings.

After the visiting telephone men were welcomed to the beautiful city of Detroit and the keys turned over to them, President Fisher delivered his annual address, which was listened to intently. Mr. Fisher is one of the old guard and the members of the Michigan organization demonstrated that they appreciate his work for Independent telephony by again re-electing him as head of the state association.

President Fisher's address was greeted with applause. It follows:

PRESIDENT FISHER'S ANNUAL ADDRESS.

"It's an ill wind that blows nobody good."

The old adage has recently been exemplified in a very positive way and may fittingly form the opening thought of your president's address.

The disturbance which produced the financial flurry in 1907 was indeed an ill wind for very many business enterprises and industries throughout the country. Shrinkage of values, shrinkage of incomes, shrinkage of profits is the burden of most reports from the business world as chronicled in the press of to-day. But the wind was not so ill as to be entirely without good features, for all well managed telephone companies have been able to demonstrate to everybody that their business has not been seriously affected by the panic. Such telephone companies throughout the United States have proved that their business is the most reliable, dependable and permanent of any in the country. Almost without exception such companies have grown steadily, though not quite as rapidly as before, during and since the panic; and they have proved by actual experience that their income is a certainty and that it can all be secured.

Your president was in a gathering of representatives of Independent telephone companies recently, representing about $50,000,000 of capitalization, and every one of them, representing different sections in the United States, reported that, while the last quarter of 1907 was a record breaker in their total collections and total number of telephones in service and showed positive growth, thus far the first quarter this year is excelling its immediate predecessor.

Independent telephone officers and managers have for years past claimed that this sort of fact would be demonstrated in the event of any financial flurry or panic, and have believed that investment in their business was especially to be desired because of this fact; that with certain income and expenses that could be estimated with very close accuracy they had a business in which net results could be predicted with almost absolute certainty. But it remained for the past five months to prove their prediction true; to convince the general public of its truth. As a result the investing public, the general public, is beginning to pay vastly more attention to telephone securities than ever before. The public knows now that a well managed telephone property is one of the safest and most desirable business enterprises obtainable; that the telephone habit, once it begins, is persistent and the average telephone user will not do without service unless compelled to do so by poverty; economy in many other directions will precede economy in the use of the telephone. So in the general discouragement of shrinking values, of diminishing gross and net incomes, there is at least one brighter outlook which telephone men have. They are encouraged to greater zeal and efficiency in their labors to more positive advancement and to the success which will inevitably result therefrom.

But, friends and neighbors, while they are enjoying the general encouragement thus mentioned, we in Michigan have a special pleasure in this, our eleventh, annual convention. We are in Detroit for that convention, and Detroit is now the home of our friends. We have been waiting for years, and at times with hope almost lost, for such a day as this. The metropolis of our state was almost entirely denied us, and was the weak spot in our telephone service for Michigan. We have looked back with feelings bordering on bitterness as we thought of how the Independent movement disappeared from our biggest Michigan city; and we have looked forward with hesitation and doubt so long that we were almost heart sick, but at last our fondest dreams are come true.

Detroit to-day has one of the finest manual telephone exchanges in the world, with almost 5,000 telephones in service and with many thousands more of orders to fill, which are being filled so rapidly that the management confidently expects to have 10,000 telephones in service by the first of July, and with new orders coming by the hundreds, weekly, the growth promises to be phenomenal throughout the whole year. Probably most of you have already seen the central exchange of the Detroit Home Telephone Company; those of you who have not will be sure to do so before you go to your respective homes and your own exchanges. After an inspection and study of the plant you will agree that your trip to Detroit is well repaid in your visit to the Home exchange if no other satisfaction were secured therefrom.

A year ago when we met in Branch county we were congratulating ourselves on the very important development nearing completion in the extreme southern part of our state. This annual convention is in a sense celebrating a still larger and further development which promises to prove the last large force in the complete development of the lower peninsula of our state. Coupled with the local development is adequate and admirable long distance service connecting Detroit with its Independent neighbors. Several first class copper circuits have been completed this month and work is in progress on others and is to be pushed with ample vigor. We shall soon have as excellent long distance service to and from Detroit as is enjoyed in any other portion of the state, and we shall be able to get substantially all the business places and residences in Detroit. This will have a pronounced effect upon the usefulness of and the benefits to be derived by the other Independent telephone systems in the state. This annual convention is indeed a jubilee occasion, and it is very natural that we are delighted to be in this goodly city under such happy conditions.

The year since last we met has witnessed decided progress among all our companies and for all our members. The development of long distance service both in quantity and quality has been marked throughout the past twelve months. A single one of our members has put up considerably more than 500 miles of first class copper circuits since we were gathered at Coldwater last year. The work of rebuilding and developing the Saginaw valley system has made most commendable pogress with increasingly bright prospects. The work of building a modern, up to date plant in the city of Kalamazoo, practically the third Independent attempt in the Celery city, has well begun, and the gentlemen at the head of the enterprise confidently promise first class service before the close of this year and that work will be resumed early in the coming month. The same gentlemen have announced their desire to take up other undeveloped or unclaimed territory in the state of Michigan and unquestionably if they shall build as they have proposed will be most welcome additions to the Independent ranks in our state. A new copper circuit has been built from Grand Rapids to Cassopolis within a short time past and Michigan now has excellent copper connections with the Independents of the state of Indiana, who have more than 200,000 telephones in service, because at Cassopolis a joinder is made with the South Bend, Indiana, system which reaches other points east, south and west from that city. In this same connection it should be mentioned that the completion of the connection with Indiana is believed to be the completion of a link in through service to the Independent system in Chicago and to points beyond. At our last meeting we talked about that with much courage and hope. The financial disturbance of the past few months, which many in the business world had anticipated several months before it was manifested unquestionably delayed the project in Chicago. But during a visit with gentlemen at the head of the Independent movement in Chicago at the time of the International association meeting in that city your president and others were informed that the work of developing a first class telephone plant adequate for greater Chicago, ultimately to be more than 200,000 stations, will begin earnestly and zealously in the coming month and will be pushed with all possible dispatch. At the same time it was announced that as soon as satisfactory service can be given in the business district of Chicago connections with other Independent companies in long distance service will be afforded. As the interests developing Chicago are also identified with the South Bend plant it seems quite reasonable that that plant will be connected with Chicago as early as any ex-

ternal to that city. We of Michigan who already have connection with South Bend with first class service which will be enlarged as far as required will share in the benefits of such connection. Substantially all of the companies of this peninsula, as you will see from reports made to Secretary Vivian and the statistics to be given later, are in excellent condition as to service in both character and quantity, and the year now closing is the most useful and satisfactory in their experiences. They have not made undue haste in their progress, nor have they at any time proven laggards.

At this point it is quite proper to add that notwithstanding the strenuous efforts to produce different conditions there has been no serious defection from the ranks of the Independents, no apostasy to the camp of our competitor. There is more positive solidarity of sentiment among the Independents in the state to-day than ever before. They realize that in union and harmony is strength for their service and investment; and as a business policy, aside from sentiment, they cannot afford to prove traitors to their allies and neighbors. This feeling is growing stronger with passing time and with the development of exchanges such as we are enjoying in this city at the present time, and also with the development of larger and better long distance facilities. The development promises in this particular feature to be greater this year than ever before, since there is every cause for it.

However, the picture is not all rosy. We are constantly compelled, each and every one of us, to a campaign of education among our rural friends. A less-than-cost policy is presented by our competitor which attempts to persuade the agriculturist that he can give himself a service at little or no expense if he but try, and if at the same time he shall connect his scheme to that of the users of the "Blue bell." More strenuous efforts in this direction are in progress now than ever before. We are in duty bound to offer a counter campaign of education, to persuade our rural friends of the exact facts, of the truth in this matter of telephone service. We have a right to say to them that but for the Independent movement and its success, the Bell patent claims which were expected to be maintained until even now or later, would certainly have effectually prevented their securing a telephone service worthy of the name. This fact alone entitles the Independents to the friendly consideration, the active gratitude, of those who wanted telephone service but could not have had it but for the Independent movement. This lesson should be instilled into the minds of our rural friends by proper use of printer's ink as well as by proper discussion with those interested in the topic. It is the usual experience with such a programme ultimately to win friends and patrons for the Independent companies whenever it is properly presented. This matter at the present juncture is one of the most important we have to consider and act upon. It is to be hoped that during the two days we are in session here there will be discussions of the various experiences of our members and of the features this struggle has presented in different sections of our state, to the end that in the multitude of counsel there shall come wisdom.

The Supreme Court of Michigan has recently handed down a very important decision regarding telephone companies in the matter of wires and cables as affected by moving buildings through the highways and streets of the state. This subject is of such importance and the decision is so valuable to all of us that your officers have had copies of it printed in circular form to distribute so that you may have copies for every one of your managers and thus protect yourselves whenever your lines are threatened under such conditions.

This again suggests the great benefit to each and all of us if the secretary's office be kept informed of all matters of litigation affecting telephone interests in any part of the state, so that the secretary can establish a publicity bureau; decisions like the one just referred to, and all others of general interest, should be known to every member of the association within twenty-four to forty-eight hours after they are rendered. With the proper care and thought on the part of our membership such matter would be early distributed to all of us. The truth of the matter is that none of us have yet relied upon the state association and the secretary's office to the extent that we can and should. The more we make of that department as a medium of communication among ourselves, of joint dissemination of valuable information, the more the importance of the membership and the meetings of the association will be realized and enjoyed.

Which again suggests that in several instances during the past twelve months the state association and the secretary's office have been the means of removing stumbling blocks from the paths of individual members; have harmonized conditions which might have caused serious conflict. The secretary in such matters has to act upon the inspiration of the executive committee as ascertained by their meetings, or after telephonic conversation with the different members, we are beginning to realize more of such usefulness than ever before, and we shall make a great mistake if we do not increase the importance of the work in this particular very materially. If any of us have a condition which does not seem to rapidly clear itself as to any of our neighbors, the good offices of the state association are at our command and may fully be expected to remove any difficulty impartially.

At our last meeting you will remember that your president urged upon you the necessity of concerted action as to certain bills pending before the state legislature. The necessity for that course became apparent to all of us later in the year. The good work then started proved successful and the hearings granted your representatives at Lansing resulted in the dissemination of much important information among both representatives and senators. That campaign proved that intelligent discussion of the matters at issue with fair minded representatives and senators is highly useful, for seven of the nine members of the committee on general taxation of the house were promptly persuaded of the righteousness of our attitude in the matter of taxation of telephone companies, and those nine representatives were the only members of the house who were thoroughly informed on the subject; that seven of the nine were so convinced, and so determined in their action later, is proof of the validity of our argument; the strength of our opinion. But that campaign also taught us, and should continue to teach, that a campaign of education of those who are expected to pass upon such questions cannot be too general or too thorough. Your president at this time calls attention to the fact that a new legislature is to be elected this fall; that men are soon to be nominated who will be elected in November and who will enter upon their duties the first of the new year. We should not wait until they go to Lansing before impressing upon them our views and the reasons for those views. We have a fund of information and argument upon such topics that has convinced good men heretofore and ought to convince other good men hereafter, but we should present our facts and reasons to all our personal acquaintances among legislative members in our respective districts, representative and senatorial, early. Fair men will grant us hearings and will listen to reasonable arguments courteously presented. The matter of taxes is not likely to be the only one that will come up hereafter. You will remember that a year ago there were measures proposing compulsory connection between competing exchanges, and compulsory connecting for long distance service. There were those who thought that such legislation would be advantageous to the public and not disastrous to telephone interests. All such possible topics should be thoroughly discussed with those who are likely to have any such measures to pass upon, to the end that the wisest possible conclusions may be reached.

During the past year but few district meetings have been held, but those were exceedingly valuable and useful. During the coming year more should be held, and at these district meetings such topics as legislation as well as interchange of long distance service, or rural telephone service, or litigation should be given very thorough consideration. In the eastern and the southern part of the state there is a sufficient number of companies to make each one of the district meetings very interesting and useful. Your officers have made it a point to attend these meetings heretofore and whoever is elected to serve you this year should expect to attend all of the district meetings.

The fundamental principle with reference to our movement is that "In union there is strength." Our state association has been valuable in the past, particularly so during the year now closed. Had we not had such organization legislation would have been adopted at Lansing to our detriment; had we not had such organization the State Traffic Association, one of the best institutions of its class in the United States, would probably never have been organized; and already the State Managers' Association has been remarkable in furthering and improving the service of our different companies, both local and long distance. We shall hear more about them before our convention closes.

This indicated the general value of associated effort. Michigan has always been interested in the National or the International association. It was one of the states which during the year 1907 contributed its full quota, and more, of the expenses of that organization. Most of us know, yet perhaps do not sufficiently realize the importance of the International association. We are fortunate to have the promise of the president and the secretary of the International association to be with us during our convention and to present matters pertaining to it for our consideration. Your president, using the strength of the company of which he is secretary, for Michigan, has already pledged its portion of the expenses for the year 1908. The assessment is $200, and a check for $100 has already been paid to the International association and the second one will be paid shortly. We have guaranteed as a state to assist in meeting a certain percentage of any deficiency that may occur, which will be explained to you at some length later.

The subject of the finances of the International association will be presented to you, and it is to be hoped that the Michigan association and its membership will maintain the high standing we have heretofore attained as part of the International body. The work, and the necessity for that organization, seems more evident and the results more invaluable now than ever before, and we should lose no opportunity to strengthen ourselves in this important feature of our associated effort.

During the year telephone companies in the state have made one radical change favorably affecting their revenue. Night rates for long distance service have been eliminated. It was found in giving that sort of service telephone companies were placing their wires at the service of their patrons twice for but one-half of the usual fee;

it was found that that condition resulted in a congestion of business at certain hours in the evening, a depreciation of service in quality, and at the same time resulted in a needless diminution of service during the ordinary business hours of the day, when conditions for giving service were at their best. It is pleasant to record that this change has been accepted favorably, indeed approved, by the public and has not resulted in any diminution of the usefulness of the long distance service. The good example of Michigan in that direction is likely to be followed in other portions of the country, as it is very certain from positive statistics that it has resulted in decided advantage to the public, as well as increased the revenue for telephone companies. In this same connection the fact should be recorded, too, that a revision of long distance rates for extended distance has occurred during the past year and at last Michigan Independent rates are substantially on a parity with Independent rates in other states. For many years, indeed since the Independent movement started in this state, the rates have been lower than in any other state in the Union. For interstate business such conditions proved unfavorable and annoying. Michigan rates were lower than they should have been and the equalization of rates has been accepted by patrons of the companies as entirely fair and proper. This will improve the revenue somewhat, which is a step in the right direction. The courage of the Independents in this regard has resulted in similar action on the part of our competitor so that no advantage in the matter of popularity has been lost by the Independents in this action.

It is believed that notwithstanding the recent stringency in the money market and the following effects of the financial flurry there will be a considerably increased activity, especially for long distance construction this year as compared with last. Until within a few months copper wire has been so fearfully high the average telephone company decided not to buy any more copper than it was absolutely obliged to. It now seems quite certain that it will be a long time before copper will reach the exorbitant prices demanded for it before the tumble. With copper wire in the neighborhood of fifteen cents per pound, No. 10 wire on poles is good property for any telephone company, but when it gets to twenty-five cents or twenty-six cents it becomes a different proposition. The reduction in the price of copper surely was a silver lining to the dark cloud of the panic for telephone companies.

Speaking of the price of material brings another thought to all of us. When we met a year ago the American Telephone & Telegraph Company was seriously planning to acquire control of the United States Independent Telephone Company, which included the Stromberg-Carlson Telephone Manufacturing Company. The theory of the United States government and of the state governments generally is that combinations in restraint of trade are illegal. The attorney general of New York state took the matter into court by injunction and the effort on the part of the Bell company to thus stifle competition in that manner was effectually blocked. Those in the scheme concluded discretion the better part of valor, and that an injunction sued out in the name of the great State of New York was not a phase of litigation they cared to cope with. The result in this case was most important and useful in that it taught all of us how and where to find a remedy against such schemes. This lesson was exemplified still further by the decision in the Kellogg Switchboard and Supply Company case in the Illinois courts. That decision handed down by Judge Windes recently leaves no room for doubt that projects of that kind tending toward monopoly are strongly frowned upon by the courts of our country; are entirely repugnant to the laws. We will do well to remember this fact in case conditions make it necessary or desirable to invoke similar protection.

Our neighbors and allies in other states all through the country are reporting gratifying growth and prosperity; the exceptions to this condition are so few as to be negligible. A review of the general conditions as disclosed at the last International convention as presented by telephone journals leaves no room for doubt on this subject and must greatly encourage all of us; indeed, we may fairly say that our lines are fallen in pleasant places. We meet in increasing numbers; with greater interest; we meet in Detroit and feel that we have a right to be here; we have no losses of prestige or opportunity to report; our co-ordinate state associations are doing excellent work, taking care of their respective fields admirably; we have a first class programme of papers, with discussions for this convention; we have good friends from abroad to counsel and rejoice with us. With our opportunities, with our blessings come responsibilities; we should not shrink from them in any degree; we should strive the more earnestly and zealously.

The reports of the officers and various committees followed, after which the special committees were announced. The roll call of companies followed, and the reports made by the representatives present showed that the Independent concerns in Michigan are in excellent condition. The programme for Tuesday provided three papers—"Dangers of Free Service," by Thomas Bromley, Jr., of Hart; "Rates," by C. E. Tarte, of Grand Rapids, and "Telephone Securities," by Max Koehler, of St. Louis, Mo.

The programme for Wednesday contained many interesting papers. The programme follows:

"International Independent Telephone Association"—A. C. Lindemuth, Chicago; J. B. Ware, Grand Rapids.

"School of Instruction for Operators"—J. P. Boylan, Detroit. Discussion.

"Tactful Relations to Patrons"—A. B. Fishback, Howell. Discussion.

"The Best Methods of Handling Subscribers, Rental and Toll Accounts"—F. M. Howard, Burr Oak. Discussion.

"Collections"—F. V. Newman, Grand Rapids. Discussion.

"What the Managers' Association Is Doing"—Wm. Robinson, Muskegon.

"Modern Construction Methods"—J. J. Speed, Saginaw. Discussion.

"What Is Being Done in Kalamazoo"—LeRoy W. Stanton.

Election of Officers. Appointment of Standing Committees. Miscellaneous Business. Adjournment.

Mr. Fishback's paper, on "Tactful Relations to Patrons," follows:

To formulate and apply fixed rules for tactful relations to patrons would be impossible. We can to a certain extent note the results of our experiences and try and improve upon them in the future, but the ways are the ways of intention, of honesty, of unselfishness, of willingness to help, of faithfulness, kindness and fidelity to trust, and if considered in any other way we shall surely find only difficulties and trouble and we certainly all have trouble enough.

Any telephone company who has one hundred or ten thousand patrons has one hundred or ten thousand different dispositions with which to deal, and which require tact, good judgment and kindness, in order to have pleasant relations.

There are so many people with so many minds and dispositions that each is too much inclined to be a law unto himself. Pleasant relations cannot be purchased, but it can be inspired.

It has been said and with a great amount of truth that, "You can lead a horse to water, but you cannot make him drink."

If we wish pleasant relations with our patrons we must get busy ourselves and never miss a chance to be polite, pleasant and courteous, even go out of our way to do it.

See how much we can do to help some one else, instead of how little, and if each one of us will get this principle firmly installed into our being we shall surely have something useful and lasting to work on. Any one of us who is lacking in these characteristics or who is not willing to try them, has something in his make-up of smallness, selfishness, even meanness, which is our duty to get rid of and the sooner the better. If any of us in this advanced age, and with the means of knowledge and the examples which are constantly coming before us, cannot grow better, and make it more pleasant for those with whom we have to deal, we most certainly have reached the extreme limit of usefulness, and it would be better for us to go to some lake, walk in and say here goes nothing.

I think perhaps in our city exchanges we are not obliged to use as much tact with our patrons, as we do in the smaller towns and country. In the cities it is a mad race for business and the little acts of courtesy and kindness are often times overlooked and even lost sight of. While we in the smaller towns are like a large family and to a certain extent dependent on one another, and very often little acts of kindness are productive of large results, and which some times very materially aid the city exchanges.

Abraham Lincoln once said, "All your cities might be demolished to-morrow and new and more beautiful cities would rise above the ruins, but if your farms and small towns were obliterated the grass would cover the streets of your cities for all time." Let our motto be, therefore, give kind and courteous treatment to our patrons and do not miss a chance even to go out of our way to perform it. Do not let petty differences weaken our efforts. Present at all times a cheerful front with those with whom we deal. Let our aim be to give our patrons the best equipment, the most perfect service, the most courteous treatment and no combination of circumstances can keep back the tide of our success.

The telephone business is a very peculiar business, and vastly different from most any other, and consequently must be handled by much different methods.

In the early days of the invention it was predicted that within twenty-five years three per cent of the population of the country would be users of the telephone, little did we realize that it would become so popular; that it would be in almost universal use in about one-half of that time.

In the city of New York there are more telephones than in any other city in the entire world, and their use has become recognized

as absolutely essential to the public, so that it seems almost impossible to get along without them. They have brought prosperity to a great many small business enterprises that would have been crushed out but for their aid, and have been a saver, of both time and money, so that the telephone has come to be a blessing to the American people. And to whom but the Independent telephone companies should the credit be given for this wonderful development in the United States, in the last ten or twelve years, in their stubborn, uphill fight against such stupendous obstacles and determined opposition? If then to us the credit is due for this condition, let us remember that it was not by our efforts alone that was brought about this wonderful advancement but by the help, aid and assistance of our subscribers who have stood manfully by us shoulder to shoulder and back to back through our many discouraging trials and who with their friendly advice and financial assistance have lifted us to nearly the topmost pinnacle of success.

Then we have a duty that we owe to our patrons that will take long, long years to repay if ever we succeed in doing so.

Then let us see to it that by little acts of kindness and cheerful manners, which cost us nothing, if we can in a small way repay them for their loyalty and financial support in the past, and which will most surely bring a continuance in the future. Courtesy and kindness is not a formality; it is a virtue, a phase of religion and we should be most heartless indeed if we would withhold it from our patrons who have done so much for us.

It is the little things that count and go to make up the larger. The little individual straws go to make up the larger bundle and without which we never would have had the bundle. Nothing is too small to be good; no act too small to be kind and courteous. None of us know what the result will be of anything we do. We think we do but we do not. Our patrons have a way of judging what we mean by what we say and do even though they do not so express themselves.

I think there is one thing we must do and that is to make our service good and each and every one of our patrons will be a booster and solicitor for the Indepenednt service, ever keeping before us the great point and that is that our patrons must be pleased and that it is necessary to render them prompt, polite, kind and attentive service. Let us not put off these duties we owe our patrons, until to-morrow, next week, or sometime in the future, but get busy at once. *Do it now.*

The committees in charge of the convention were: Arrangements committee, W. B. Woodbury, Detroit; W. J. Melchers, Alma; W. S. Vivian, Grand Rapids. Invitation committee, W. J. Melchers, W. B. Woodbury, C. B. King, Ann Arbor; W. S. Vivian. Registration committee, A. A. Burch, Battle Creek; W. S. Vivian; M. A. Porter, Northville; L. L. Conn, Alma; W. H. Swaverly, Kalkaska; C. H. Rauch, Plymouth; H. T. Clough, Owosso; Charles Hood, Detroit. Press committee, H. H. Mack, Detroit; A. E. MacKinnon, Battle Creek; W. S. Vivian. The reception committee included C. E. Tarte, chairman, Grand Rapids; O. W. Hunt, Adrian; W. A. Young, Benzonia; M. W. Briggs, Dowagiac; William Robinson, Muskegon; N. F. Wing, Grass Lake; W. B. Woodbury, Detroit; George Thorward, South Bend, Ind.; R. C. Smith, Homer; J. E. Hisey, Laingsburg; Thomas Bromley, Jr., Hart; W. H. Graves, Leslie; G. S. Stout, Lake City; F. W. Gradolph, Dundee; W. W. Crabbs, Morenci; J. J. Speed, Saginaw; A. C. Himebaugh, Burr Oak; C. W. Swaverly, Kalkaska; W. J. Melchers, Alma; C. B. King, Ann Arbor.

The old officers were re-elected as follows: President, E. B. Fisher, Grand Rapids; secretary, W. S. Vivian, Grand Rapids; treasurer, A. C. Himebaugh, Burr Oak.

IMPROVED GERMAN TELEPHONE SYSTEMS

Description of Intercommunicating Systems Operated in Connection with Party Lines and Central Office Exchange Trunks

By Dr. Alfred Gradenwitz

IN order to standardize the use of telephone apparatus as far as possible, the German postal department, which controls the entire telephone business in the German Empire, a few years ago authorized the connection of party lines to central office exchange circuits, providing that not more than five telephones be connected to one exchange line. The annual charge for the use of such a trunk line being twenty marks (about $4.80) per circuit, providing the installation of the apparatus were made by the postal department. In the instance of the subscriber supplying the necessary apparatus required in the intercommunicating or party line system, then the charges for the line is cut in half. It is required, however, that the apparatus which may be connected to the lines should be the same with regard to general arrangement and operation of the instruments as those regularly supplied by the postal department.

Since the postal department has offered the special concessions it has resulted in an increased volume of telephone traffic; the great increase being due, of course, to the inauguration of a system which permitted an extension of the service into the different manufacturing establishments, and providing not only a means for any of the different departments reaching the central office but also communicating between the different departments of the establishment. Owing to the fact, however, that telephone installations of this kind have been greatly improved during the past few years, the advance in the art is required to be taken into account when party line stations are offered for connection with the exchange line.

The Siemens and Halske company has recently brought out an improved line of apparatus and it is the purpose of this article to briefly describe the system.

Intercommunicating systems and party line systems should be distinguished according to whether all subscribers are authorized to communicate both with each other and the exchange, or whether only certain subscribers are allowed to communicate with the exchange while the remaining subscribers are at liberty to communicate among themselves. The type of apparatus described in the following belongs to the latter class. Communication with the exchange can be obtained in two different manners: First, direct from the subscriber's station by connecting the telephone circuits with the exchange line and without the assistance of an intermediate operator. Second, connection may be established with the exchange through the assistance of a third party, that is, the intermediate operator. The first plan we shall term the automatic interconnecting system: the second plan, the intermediate switching sys-

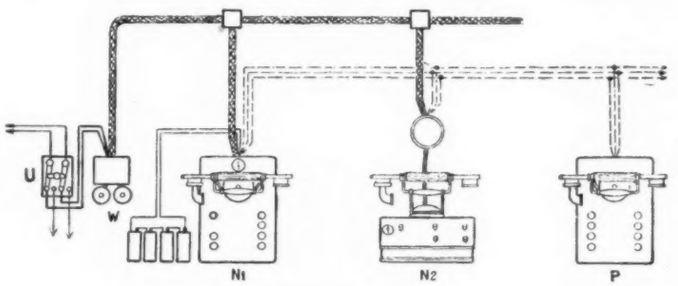
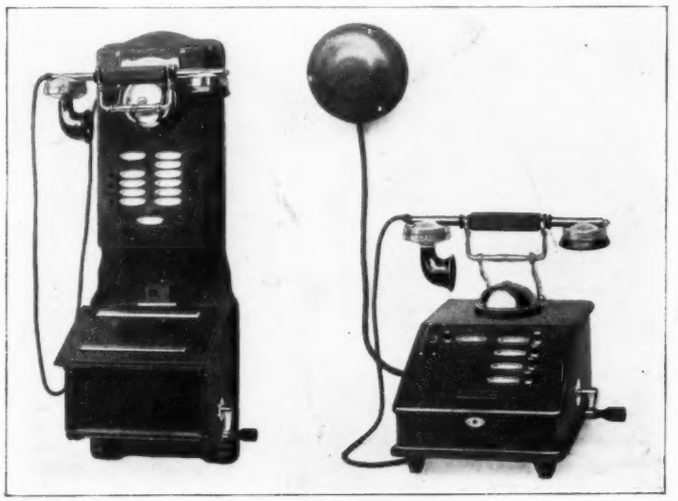


Figure 1—Automatic connection system.

tem. The automatic interconnecting system should be used wherever the number of exchange lines is limited, and the intermediate switching system should be used where a considerable number of exchange circuits are provided.

Figure 1 shows, in general, the arrangement of a system in which a subscriber is able to call the central office direct without the assistance of an intermediate operator. The circuit from the exchange is connected by the postal department to a double-throw switch, *U*, which enables the private station to be separate from the exchange circuit. *N*1 and *N*2 are subscriber's stations of a type illustrated by Figures 2 and 3, representing respectively wall and desk sets. These sets are equipped with line selectors for intercommunicating service. The button which is shown at the left of the top of the telephone instrument is used for connecting to the exchange circuit. *P* is a private station equipment, such as has no means for communication with the central office. Each private station is provided with a device for indicating visually when the exchange circuit is busy, thus avoiding any useless attempts and loss of time in attempting to secure a connection.

In order to prevent any interruptions while the circuit

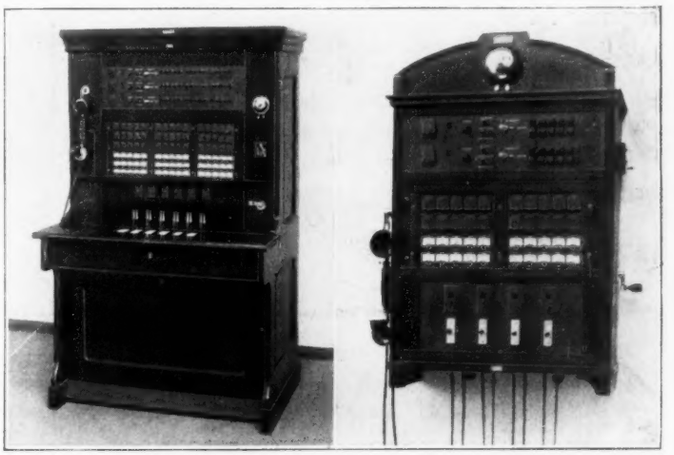


Figures 2 and 3—Wall type telephone. Desk type telephone.

is busy, all private stations are provided with a locking relay which prevents any interruption of an existing exchange connection. Whenever there is need for an immediate local inquiry during the conversation between a given station and the exchange circuit, a special device can be used, and it consists of a special key termed "inquiry key," the use of which permits a special communication to be established.

In the intermediate switching system, the exchange circuits—which are carried to lever switches, as explained above,—together with the wires from the private or party line telephones, terminate in the central switchboard which is so designed as to absolutely exclude the possibility of any interfering connections, even though the intercommunicating service is provided for between the party lines and the exchange. To accomplish this result, both the exchange and private station conductors are connected to push buttons, which, together with necessary apparatus, such as calling keys, listening and supervisory signals, are combined with exchange switching keys. Each comprises as many push buttons as there are party lines in order to allow each party line to be connected with the exchange conductor.

Figures 4 and 5 represent switchboards, respectively, for three and two exchange trunks. In order to avoid any tying up of an exchange line through a party line subscriber not disconnecting, a special disengaging device is actuated whenever the inquiry switch referred to above has been brought to its normal position. The installation of the disengaging device also prevents any simultaneous connections between a given exchange conductor and more than one private line telephone. The duration of any conversation had over an exchange circuit is indicated by the supervisory signal belonging to each line. The disconnect signal at the exchange is actuated direct from the party line, and where

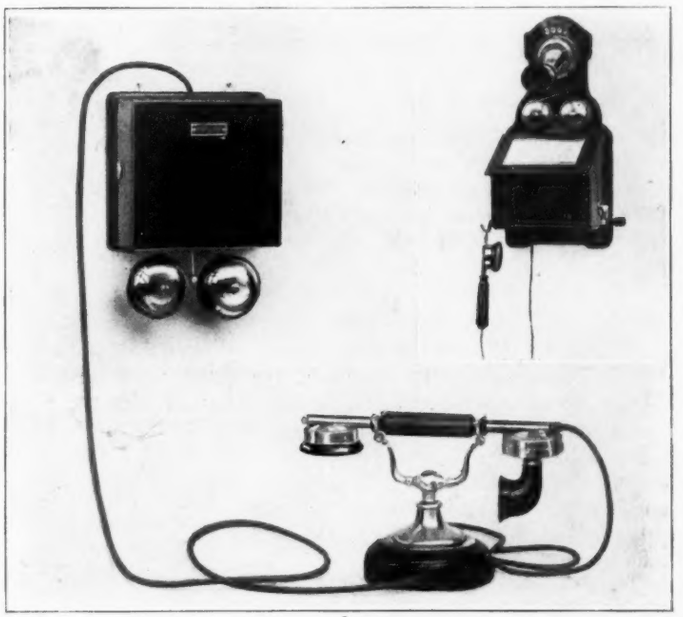


Figures 4 and 5—Switchboard with three trunk lines. Switchboard with two trunk lines.

a common battery system is not operated the clearing-out signal is projected over the line in the usual manner by driving a magneto generator.

The usual drop signals are frequently used as call indicators, although the use of the incandescent lamp as a line signal is also provided for.

In the larger systems of private exchange installations,



Figures 6 and 7—Battery call type telephone. Generator call type

special switchboards may be installed and operated in connection with the main exchanges on the branch exchange plan. The types of apparatus used at the substation in connection with such plants are shown by Figures 6 and 7. The equipment shown by Figure 6 being designed for automatic calling service, and Figure 7 is arranged for manual calling.

Manufacturer's Department

By W. H. Graffis

THE MOORE CALENDAR FOR SPRING.

ALFRED F. MOORE, of Philadelphia, is preparing for the spring trade, and announces that he has a complete line of switchboard cords, receiver cords, insulated wires and cables, to offer at attractive prices. The April calendar as shown herewith is being circulated, and bears the interesting Moore talk as follows:

Alfred F. Moore calendar.

"Send us one of your plugs to be fitted with a free sample switchboard cord for trial. Our new style cord is made of solid conductors insulated with silk, and laid up in spiral form with a pure linen braid over all, treated with a moisture-proof wearing compound. They will outlast any other cord, need no attention, and can be repaired quickly on the board.

"Try one at our expense and then send an order for more. Don't postpone action until a more convenient time, but write now while the subject is upper most in your mind. We will consider it a privilege to acquaint you with our wires and cords, in any and every way we can."

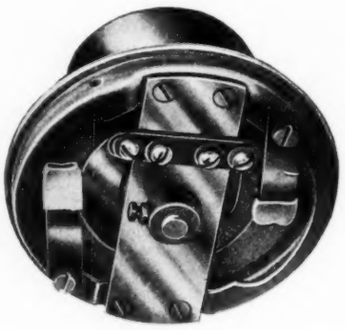
SUMTER'S "NEW BEAUTIES FOR 1908."

THE improvements found in the 1908 "New Beauty" type of instruments are entirely original with the Sumter Telephone Manufacturing Company, of Sumter, S. C. The instruments made by this company require very little if any description of a general nature, therefore all that is necessary is to note the improvements made in those parts which, it is said, mark an actual advance in the state of the art.

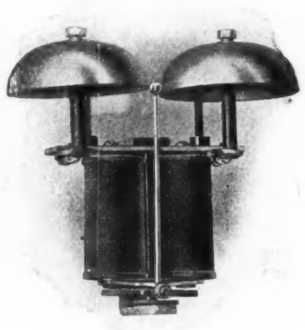
As the satisfactory operation of a telephone depends upon its ability to "talk," and as this ability depends largely upon the transmitter, the Sumter Telephone Manufacturing Company has conducted experiments with a view to improving both mechanically and electrically this part of its equipment.

The peculiar features of the Sumter transmitter are its extraordinary carrying power with a very large volume this being noticeable on short lines. If the transmitter is unpleasantly loud for local service, it is necessary to use but one cell of battery instead of two, thus effecting a great saving when the telephones are not required for long distance service. The instrument possesses a clear, high tone and transmits speech without apparent distortion. As the instrument has a maximum of volume with a minimum of battery consumption, gained by using a combination of metal and carbon electrodes, it is also particularly well adapted for use in exchanges where operating expenses must be kept at the lowest possible point.

Facility of adjustment without the use of tools is one of the advantages enjoyed in the construction of the company's new ringer as shown in the accompanying illustration. Aside from the mechanical advantages of this construction, a distinct gain in electrical efficiency is claimed for this

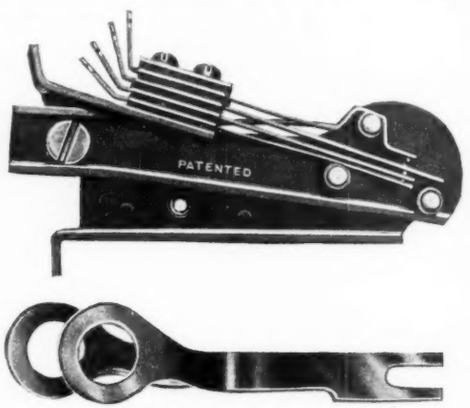


New Sumter transmitter.



New Sumter ringer.

ringer on the ground that as the iron parts of any ringer are subject to a magnetic reversal, which takes place during each revolution of the generator armature, the more iron parts there are, the less sensibility the ringer will possess; and, in addition, the adjusting wheel is made of soft iron which, being placed directly beneath the end of the magnet and the armature itself, serves to conduct the



New Sumter No. 64 switch hook

magnetic lines of force directly from the magnet to the armature, thus magnetizing it to a greater degree than has heretofore been possible and securing a maximum efficiency. A distinct gain in sensibility and strength of stroke also is attributed to this cause.

The Sumter switch hook, it is claimed, reached that degree of perfection long ago where a loose contact is un-

known, but in the No. 64 switch hook, shown in the accompanying illustration, the company has a piece of equipment claiming many advantages from a mechanical standpoint. The springs are self-adjusting inasmuch as they are held by rubber rollers mounted on heavy pins. The rollers act to bring the springs together with a biting motion when the receiver is removed from the hook. Nothing but the best hard rubber bushings and sheet stock is used for the insulation between the contact springs. This insulation is made exceptionally thick and heavy, so that lightning will not cut across between the springs and cause trouble. The springs themselves are made from heavy German silver which is carefully polished. The hook base is stamped from sheet steel and the raising spring for actuating the hook lever is of round steel, same as employed in high grade mechanical devices. The spring is heavily enameled with baking enamel so that rust is entirely prevented.

The escutcheon plate is held in position on the telephone instrument by two machine screws which also hold the hook in the telephone box. The hook which is a heavy clamping from sheet brass, beautifully nickeled, is inserted through the escutcheon plate in the usual manner, and is clamped to the hook by means of a heavy steel set screw. The escutcheon plate does not limit either the upward or downward motion of the lever, this being taken care of by a permanent adjustment, forming part of hook base itself. For shipment, or in case of breakage, the hook lever can be withdrawn from the hook by simply loosening the cap screw and pulling the lever out. This is said to be a more advantageous method of combining the hook lever with the hook mechanism.

The Sumter Telephone Manufacturing Company has recently issued a "Beauty Booklet," describing the different parts with which their telephones are now being equipped. It was designed primarily for distribution among rural customers, and is written in non-technical style, while the illustrations are self explanatory. Inquiries are solicited and bulletins describing the Sumter telephones and switchboards will be mailed upon request.

THE ERICSSON HARMONICS.

RECOGNIZING the harmonic ringer as the best type of signaling apparatus for party line service, and realizing the great demand that there would be for a really successful harmonic ringer, the L. N. Ericsson Telephone Manufacturing Company of Buffalo, New York, after many thorough tests and trials has placed on the market a harmonic ringer known as the "Success" harmonic, because the name exactly suits the apparatus.

There have always been so many drawbacks connected with harmonic ringers heretofore that a large number of companies have shunned them as "impossible." This mostly because of its complicated design and mechanism. The extremely accurate micrometer adjustment necessary to the working of the ringer has always been found a bugbear and the hum of the armature as well as cross ringing has always been evident, and the mechanically predetermined path that the armature must follow results always in a very disagreeable hum in the case of high frequencies.

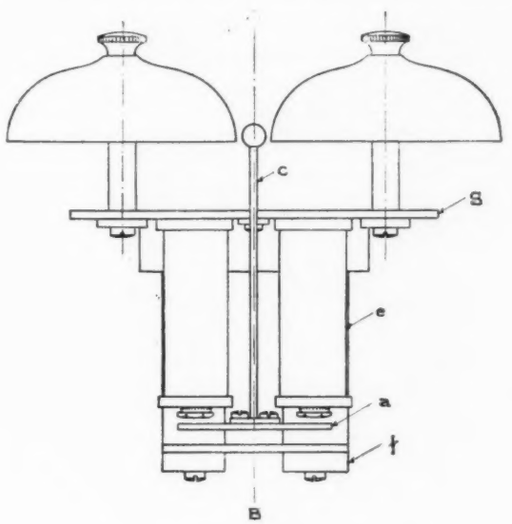
Many attempts have been made to do away with these bad features but without success, until the new Ericsson ringer came on the market.

The adjustment of this ringer is no more than two nuts at the ends of the poles. These are properly adjusted before leaving the factory and unless *unusual* line conditions exist, they need not be considered. The working of these ringers does not depend upon accurate adjustment any more than the ordinary polarized ringer.

The long armature support in the "Success" ringer results in the armature being freely supported in front of the pole pieces, and responding accurately to the electrical impulses in its own natural path of vibration.

The accompanying illustration shows the unusually simple construction, "a" being the armature suspended by the steel rod "b"; "c" is the clapper rod, "d" the clapper, "e" one of the coils and "f" one of the permanent magnets. "b" and "c" are rigidly fastened to the armature "a" by double and knurled cones over which is a double screw clamp, making it impossible for the armature to turn or work loose. The same method is used for fastening the suspension rod "b" to the frame "g."

Unlike other harmonic ringers, where the armature and clapper must work absolutely in step, this construction is more elastic, permitting a wider range of vibration of the clapper without throwing the entire movement out of tune. This is due to the existence of a non-vibrating point on the clapper rod between the armature and the clapper. The location of this point is determined automatically by the length of vibration of the clapper, which is fixed by the



Line drawing of Ericsson harmonic

distance between the gongs. This feature results in a floating self-adjustment of the moving parts which automatically takes care of any inaccuracies of adjustment.

The loud hum, when acted upon by the higher frequencies, present in ringers having the armature supported very close to the pole pieces, is eliminated in the Ericsson harmonic ringer by this novel armature construction. There is no cross ringing or interference, and on account of the small clapper the response to the proper frequencies is instantaneous. The simplicity of construction, freedom from interference, ease of adjustment, and positive action, mark an advanced step, it is said, and make the Ericsson the most perfect harmonic ringer on the market.

PRIVATE BRANCH EXCHANGE SWITCHBOARD.

A CENTRAL energy private branch exchange switchboard that accommodates an ultimate equipment of either 120-lamp line equipments or 120-visual signal equipments is an economical arrangement for a popular type switchboard introduced by the Stromberg-Carlson Telephone Manufacturing Company February 1st. The cabinet is of simple design and greatly resembles its A-2766 private branch exchange cabinet with the addition of several new features in the general assembly of the equipment inside of the cabinet. Orders for this switchboard equipped with No. 14 visual signals in the following amounts has been reported: 100 lines, Hotel Livingston, Dwight, Illinois 20 lines, Trenton, New Jersey; 30 lines, Oil City, Pennsylvania; 16 lines, Sioux City, Iowa; 20 lines, Ottumwa, Iowa; 500 lines, Lewiston, Montana. The board for the Lewiston-Billings Mutual

Telephone Company, Lewiston, Montana, consisted of two No. 1522 sections with an ultimate equipment of 100 line drops and 600 No. 14 visual signal equipments; also complete toll trunk, transfer order wire equipment.

NEW CRACRAFT-LEICH TELEPHONE.

THE CRACRAFT-LEICH ELECTRIC CO., of Genoa, Ill., has aimed in its new compact type magneto telephone to produce a good common-sense telephone with all the necessary and useful appliances, but to eliminate all useless devices.

One of the many good features is the simple and convenient gong adjustment of the ringer. The gong posts are riveted solidly on to the heel irons of the ringer. The gongs have their holes drilled a trifle off center, making it possible to give them a delicate and positive adjustment from the front of the telephone and still have the gong post a part of the ringer frame.

The receiver is of the permanent set type with no adjustment for the air gab between the pole pieces and dia-

New Cracraft-Leicht compact type magneto telephone.

phragm. The pole pieces are ground exactly to the right depth, insuring a most efficient and permanent adjustment. The switchhook is of the long lever removable hook type with long contact springs, platinum pointed throughout.

The transmitter, the result of long years of experiment, is neat in design, and, it is said, will transmit speech clearly a longer distance with two cells of dry batteries. It is claimed it has a higher resistance than any other transmitter on the market to-day.

The most important feature, aside from the mechanical working parts, is that the generator is strongly made with the proper air gab and correct amount of iron in the armature in connection with the winding space.

The magnet steel is of the highest quality and is accurately formed to size.

The induction coil is located in the most accessible position possible. The terminals are so fastened that they will not twist on the spool head and break off the fine wire leading to them.

The condenser is also mounted on the door and all bridging telephones are so wired that a condenser can be put in the telephone at any time by fastening it directly under the lower wire after cutting same and then soldering the two ends to the two condenser terminals. The wiring to all apparatus mounted on the door is exposed and readily traceable.

In fact, every detailed part of this apparatus has been carefully studied and thoroughly considered before it became a part of the telephone. The cabinet is of latest design and quality. The complete instrument is claimed by the company to be of the highest grade known in modern telephone engineering.

INTERNATIONAL FOREIGN BUSINESS.

WHILE the European telephone manufacturers with their cheap labor and low price on raw material, have up to but very recently been able to control the foreign market they are however now being met by sharp competition in their own field with the greatly improved apparatus developed by the Independent manufacturers of this country. The greatly simplified design of the system as well as the much more modern method of construction by the manu-

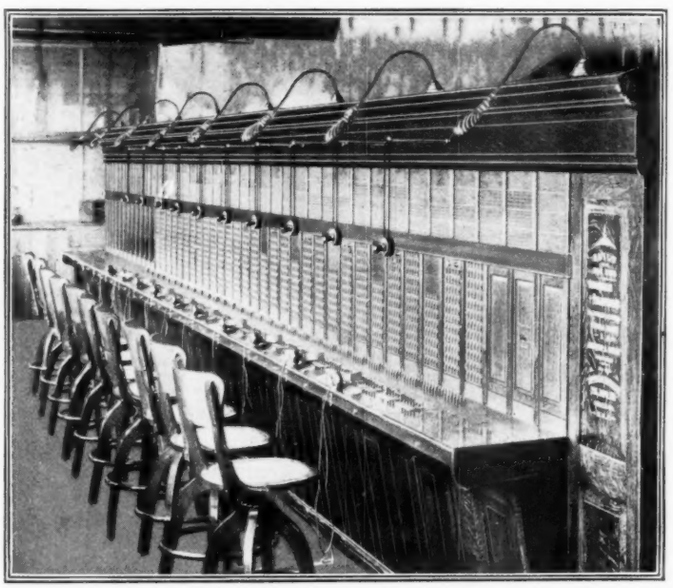


Figure 1—International convertible type multiple switchboard.

facturers here has more than overcome the cheap labor and material of the foreign manufacturer.

One of the first and largest equipments manufactured outside of Europe for any South American company was the installation made by the International Telephone Manufacturing Company of Chicago for the Comp. Telephonica Do Estado de S. Paulo, Sao Paulo, Brazil, for which exchange the International company has recently received an order for additional sections completing the system to 2,000 lines.

The Sao Paulo company was started about fifteen years ago by one of the largest telephone and electrical manufacturers of Germany who then turned it over to some local people. The exchange was built with single line ground return construction, with the typical German style subscribers station instruments of the magnetic call local battery type with its two large receivers, and with a central office equipment of the flat table pattern.

When the old board had reached its full capacity, the company was not in a position to completely rebuild the outside lines and replace the subscribers' instruments as well as install a new switchboard. It was planned to replace the sectional table boards with a larger multiple switchboard, and the International "Convertible" system was

adopted. While the original cost was considerable greater than a straight magneto multiple equipment of European manufacture, the International proposal was the only one contemplating the furnishing of an equipment that could be converted into a central energy system without discarding any of the apparatus installed, making it especially adapted for this purpose.

Figure 1 shows the main switchboard which consists of five sections of three operators positions each, arranged for one hundred sixty lines to the operator. The rear of the board is properly closed with removable sliding doors. Each operator's position is equipped with a swinging adjustable transmitter operators' set complete with a line pilot and clearing out pilot, fifteen pair cords, plugs and weights, fifteen ringing and listening keys with ring-back key on the answering cords, and fifteen clearing out drops besides the required line equipments. The clearing out drops are so arranged that with a change of a connection they will operate properly when the system is used as a central energy equipment.

Figure 2 shows the combination main and intermediate distributing rack and lightning arrester and protector frame, the line relay rack and power plant. The storage battery charging machine and ringing generator and the power board which are built for operating and controlling the plant when used as a central energy system. The batteries in the present installation are for the operators' set and busy test.

Figures 3 and 4 show a front and rear view of one section of the main board. At the bottom of the frame is a hardwood cable chute. The small box in the rear of the section at the bottom above the cable chute contains all the auxiliary equipment of the operators' set.

Figure 2—Protective apparatus, power board, etc.

Immediately above this are mounted the line and clearing out pilot relays and the impedance coil. At the side of the operator's set auxiliary apparatus are mounted strips of double end terminal clips for the line circuits. The drops and jacks are connected to these terminals by a hand made cable form, securely soldered in. This arrangement of the apparatus and the wiring leaves all parts free for convenient inspecting.

The line drop and associated answering jack are supported on the same base which is made of an extruded brass angle piece. The combined drop and jack are supported on a strong steel mounting plate in banks of five to which they are securely fastened with the ferrule of the jack. The line equipments are individually insulated from the mounting strip by heavy sheet micanite and hard rubber bushings. The strips of drops and jacks are securely fastened to the architectural iron sections by heavy machine screws. This strong construction made it possible to install all the

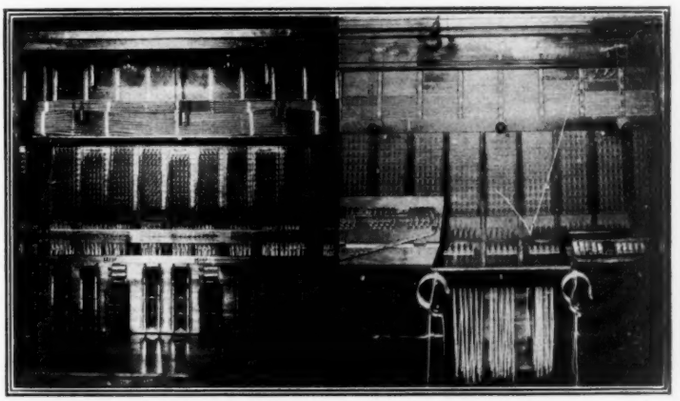


Figure 3—Rear view. Figure 4—Front view.

working parts before shipment, and sustain no damage from the rough handling in the numerous transfers to which such foreign shipments are subjected. The system is so designed that the line equipments as well as the cord circuits and operators' sets are fully wired, leaving only the multiple jacks to be installed by the purchaser.

The International company also cut to the proper lengths all of the multiple and connecting cables, properly formed, butted and waxed all the ends of the cable and soldered in the multiple jacks, leaving unsoldered only the connections at the line terminal strips, relay rack and distributing frame. The iron cable chute was built sectional so the parts were readily placed in their proper positions and fastened together with machine screws. The cabinet work also was built sectional so it was readily unmounted for convenient foreign shipment. All of the parts not fully connected were marked and accompanied with blue prints to the floor plan and detail instructions as to connecting and operating. Though the engineer of the local company who installed the apparatus had no previous experience with central energy or multiple switchboards found no difficulty in completing the work and placing it in full running order when the connections were made from the old board to the new without the slightest trouble. This equipment, it is claimed, was the most completely wired and connected multiple switchboard ever shipped out of any telephone factory. The International type of apparatus is especially adapted for the foreign trade where it is inconvenient and expensive to send special expert installers. This not only saves the traveling expense and time of special installers but also makes it much easier and quicker to install the apparatus when delivered, as well as insuring more permanent and more reliable work.

It is this convenience as well as the modern design and high class of workmanship that has rapidly made the International Company a factor in the foreign field.

DEAN BRANCH IN SAN FRANCISCO.

THE Dean Electric Company is opening up a branch house in San Francisco, which will be in charge of George A. Scoville. Mr. Scoville will have under his direction a competent staff of experienced salesmen, and a complete stock of every type of telephone apparatus will be carefully maintained. Mr. Scoville is now on the coast selecting quarters and thoroughly going over the ground be-

fore the organization of his selling forces. Ray H. Manson has been appointed engineer in charge of sales, with headquarters at the factory in Elyria, Ohio.

W. J. STANTON.

MR. W. J. STANTON, formerly sales manager for the American Electric Telephone Company, has been engaged by the Dean Electric Company and assigned to travel in the state of Iowa.

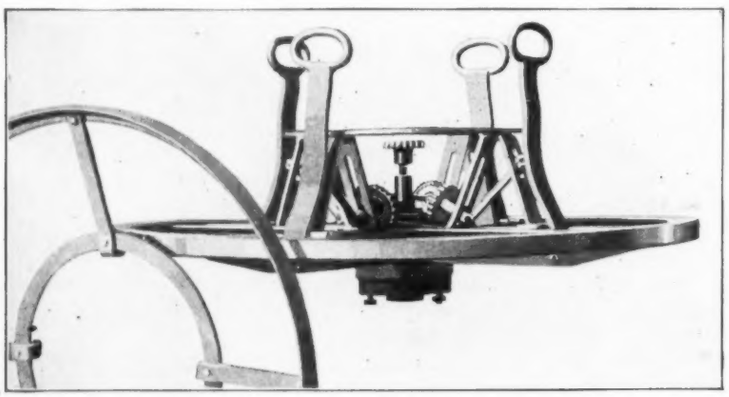
Mr. Stanton is not only an experienced salesman, but is a telephone investor and operator on a large scale. He is prominently connected with several trade publications and

W. J. Stanton, Dean salesman.

should materially increase the Dean company's business in his territory.

M'MAHON WIRE REEL AND CABLE GRIP.

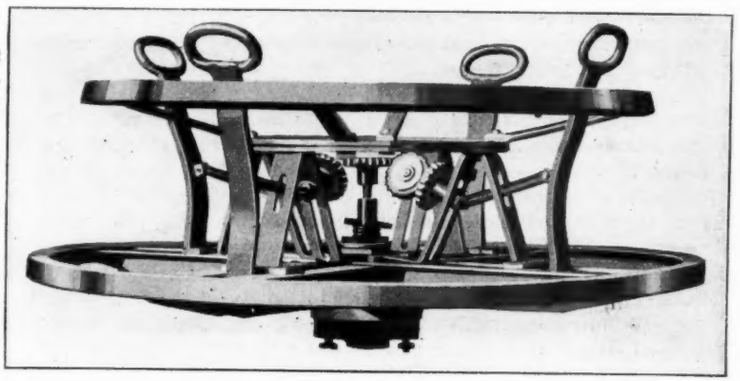
THE most frequent compiaints made against wire reels are that they are practical for unreeling only one coil of wire; they do not hold the coil tightly so as to prevent it from slipping and the wire from twisting, and there is no way to adjust the tension and prevent tangling. The slipping of coils and tangling of wire is particularly bad, as it causes loss of time and the injury to wire, with the consequent impairment of service. Every telephone construction man has experienced the inconvenience of having two reels on a line-order wagon, and it often occasions expense and



McMahon wire reel.

delay by reason of sending the wagon back for supplies which could not be carried on the first trip.

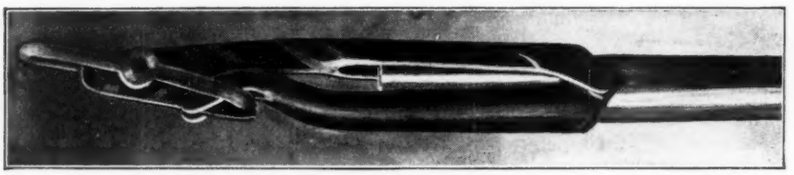
A reel recently put on the market by Clarence Mayer, 904 Ellsworth building, Chicago, is claimed to combine all the good qualities of the ordinary reel besides being adjustable to any size coil, having a friction brake, and capacity for two coils of wire. The reel was designed by O. E. McMahon, a general foreman for a large telephone company, and used by his foreman with success. The reel



McMahon wire reel.

is constructed throughout with steel, heavily galvanized, and is practically indestructible.

Another device which should appeal to every telephone



McMahon cable grip.

company installing underground cable is the McMahon underground cable grip. The grip makes the pull on the whole cable-sheath and core, without injuring the cable. It grips only six inches of cable. It may be connected and removed instantly, and the harder the pull the tighter the grip.

The grip does away with the old fashioned wire lash, which at the best is expensive to make, and, even if it holds, it often ruins five or six feet of cable. The grip is made of steel and weighs ten pounds. Detailed information concerning these devices can be secured by addressing Clarence Mayer, 904 Ellsworth building, Chicago.

THE HARGIS METHOD IN AERIAL CABLE CONSTRUCTION.

A LITTLE over a year ago the Central Union Telephone Company, which is one of the largest of the Bell telephone companies, decided to test out twenty-five Hargis

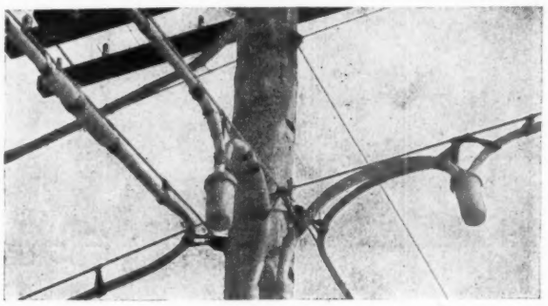


Figure 1.

splicing joints under actual service conditions. With this end in view the company installed these joints in its Irvington exchange district in Indianapolis. Careful account was kept of all costs and the joints were inspected regularly after installation to ascertain how they were acting during the period of test, which was to be one year. Through the courtesy of Robert Cline, superintendent of this company, we are

enabled to publish six excellent and typical photographs of these joints which show a number of the ways in which they may be used to advantage in aerial construction. A request for an explanation of these pictures and his opinion of the

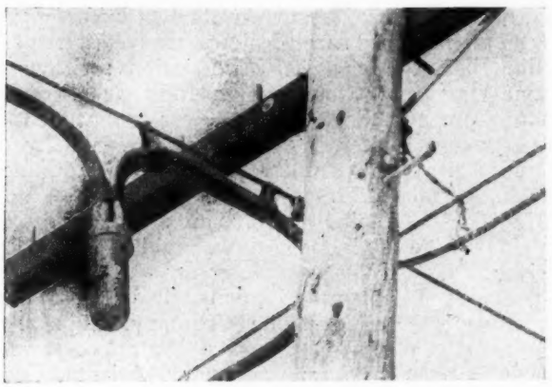


Figure 2.

Hargis joint brought the following interesting reply from Mr. Cline:

"I beg to advise you concerning the uses made of the

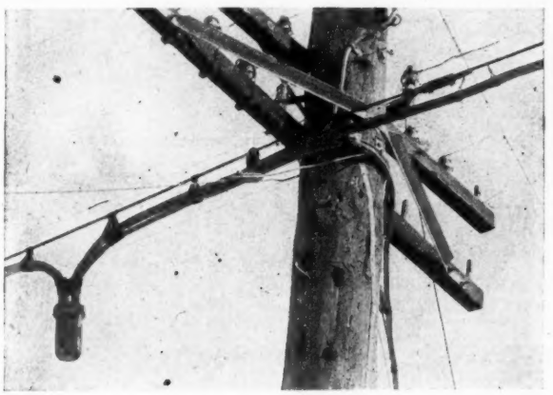


Figure 3.

Hargis joint in connection with our Indianapolis work, especially those exhibited in the photographs herewith.

"Figure 1 represents the use of two No. 3 Hargis joints. The one designated by the letter *A* connects a 200-pair underground lateral cable with a 200-pair aerial cable, which

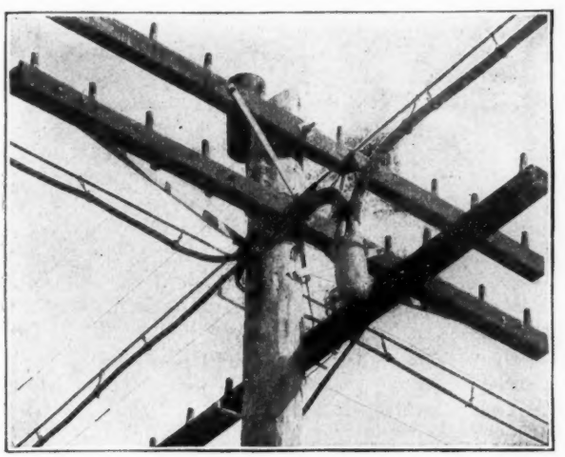


Figure 4.

will admit of opening the splice quickly to locate trouble either way therefrom. The one indicated by the letter *B* joins together with a 200-pair underground lateral cable, out of which are taken two aerial cables, a 150-pair and a 50-pair, at the same time providing facilities for opening the splice as in case of the former one.

"Figure 2 shows the method of joining together a main aerial cable of 150 pairs and two branch cables, one of 100 pairs and the other of 50 pairs.

"Figure 3 represents a No. 3 Hargis joint used for joining together a main cable of 200 pairs, a 150-pair extension and two of 15 and 25 pairs, respectively, with 10 pairs left dead for future use. Either one of these 10 pairs may be util-

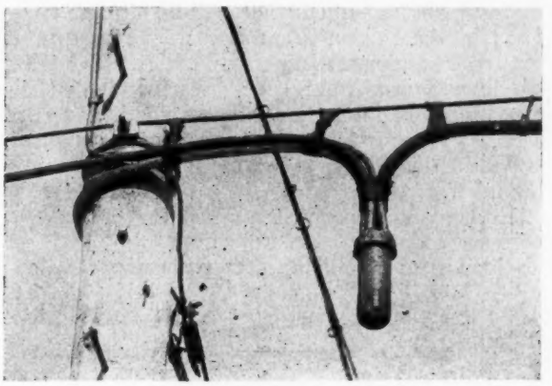


Figure 5.

ized in the taps or extension cable as may be required.

"Figure 4 represents a No. 2 Hargis joint used for the purpose of joining together a main cable of 100 pairs, two 50-pair branches and a 25-pair tap for local distribution.

"Figure 5 shows the methods of joining together one main

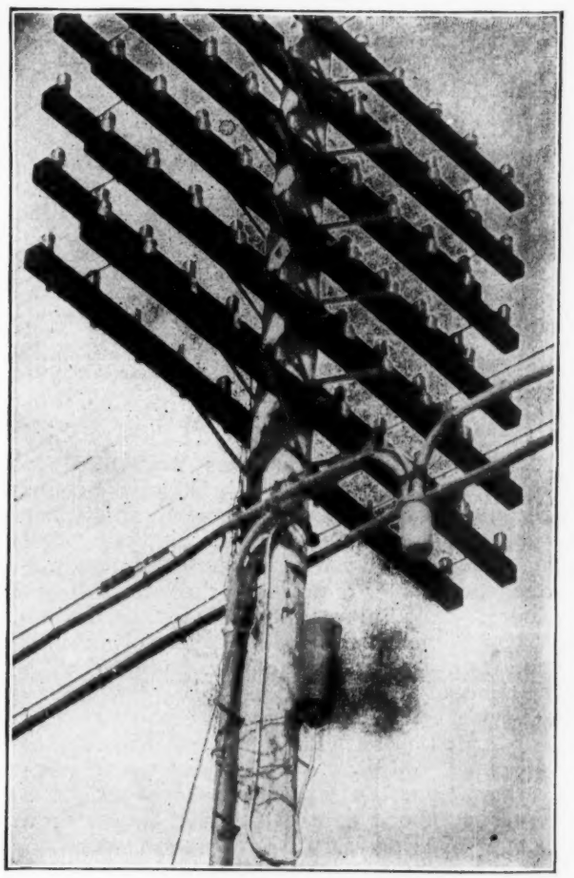


Figure 6.

cable of 150 pairs and three branch cables of 75, 50 and 25 pairs.

"Figure 6 represents a No. 3 Hargis joint used for the purpose of joining together a 200-pair main cable, a 100-pair extension, 75-pair branch and a 25-pair tap.

"It will therefore be seen that the Hargis joint may be used with ease for any combination of cables desired. Our experience with the use of these joints so far has been very satisfactory and compares very favorably with the ordinary 'Y' splice."

TELEPHONE RECEIVER CORDS.

ORDERING receiver cords that will fit is made easy, it is said, by the new method of cataloguing, shown in the accompanying illustration. This plan has been worked out by the Belden Manufacturing Company, of 194 Michigan street, Chicago, Illinois. It presents detail drawings and shows concisely and fully the information desired for the complete identification of any particular cord and terminals. As all the standard styles of tips, fasteners, etc., are included in this line, a telephone manager can order the desired number of styles "A," "B," etc., and be sure, in advance, that he is getting just exactly the cords he wants to use.

The Belden Manufacturing Company reports that it is doing an extremely good business with these receiver cords. Operating companies in all parts of the country are using them, and expressing the greatest satisfaction with their wearing qualities. Before this style of cataloguing was adopted the Belden company found that operating companies had the greatest difficulty in describing the different kinds of cords which they wanted to order so that a manufacturer could intelligently fill an order. Now it is easy, even for a man having an exchange equipped with many different types of telephones, to order just what he wants. Besides having complete information regarding all the different cords used on telephones and switchboards, the catalogue contains a list of all Belden products, including magnet wire, cord tips, tinsel and copper cordage, cotton sleeving and many other things which will interest managers of exchanges of all sizes.

STANDARD TELEPHONE RECEIVER CORDS
STYLE A. SOLID TIPS BOTH ENDS. STAY CORDS BOTH ENDS
STYLE B. SOLID TIPS ONE END. BARE TINSEL OTHER END. STAY CORDS BOTH ENDS
STYLE C. SOLID TIPS BOTH ENDS. STAY CORDS BOTH ENDS WITH FIGURE 8 CLIP (PIECE NO 2) FASTENED TO ONE STAY CORD
STYLE D. SOLID TIPS ONE END. SPADE CLIPS (PIECE NO. 1.) OTHER END. STAY CORDS BOTH ENDS
STYLE E. SOLID TIPS ONE END. SPADE CLIPS (PIECE NO. 1) THE OTHER END. STAY CORD WITH FIGURE 8 CLIP (PIECE NO. 2) ONE END. NO STAY CORD OTHER END
STYLE F. SOLID TIPS ONE END. BARE TINSEL LOOPS THE OTHER END. STAY CORD WITH FIGURE 8 CLIPS (PIECE NO. 2) ONE END. NO STAY CORD THE OTHER END
STYLE G. BARE TINSEL CONDUCTOR BOTH ENDS. STAY CORDS BOTH ENDS
STYLE H. SOLID TIPS BOTH ENDS. STAY CORD WITH FIGURE 8 CLIP (PIECE NO. 2) ONE END. WIRE HOOK (PIECE NO. 6) SEWN IN OTHER END
STYLE I. SOLID TIPS BOTH ENDS. NO STAY CORDS BUT WIRE HOOKS (PIECE NO. 6) SEWN IN BOTH ENDS

Method of cataloguing for ordering receiver cords.

CORWIN COMPANY SALES.

THE Corwin Telephone Manufacturing Company, of 147 South Clinton street, Chicago, announces constantly increasing sales for its automatic intercommunicating telephone systems and apparatus which are made to meet any and every condition in intercommunicating work. Its apparatus is made in various styles including desk sets and wall types of cabinets. Some of its recent sales are as follows:

Home Telephone & Telegraph Company, Fort Wayne, Indiana, eighteen-station system in its own exchange; Marshall & Yarnell, hardware dealers, twelve stations, and Perfection Biscuit Company, twelve stations; Crown Point Telephone Company, Crown Point, Indiana; Fort Dodge Telephone Company, Fort Dodge, Iowa; Independent Telephone Company, Everett, Washington; Twin City Telephone & Telegraph Company, Minneapolis, Minnesota; Wichita Independent Telephone Company, Wichita, Kansas; Mansfield Telephone Company, Mansfield, Ohio; Phelps County Telephone Company, Holdredge, Nebraska; Fox River Valley Telephone Company, Green Bay, Wisconsin; Zenith Telephone Company, Duluth, Minnesota; Topeka Independent Telephone Company, Topeka, Kansas; Corn Belt Telephone Company, Waterloo, Iowa; Atlanta Telephone & Telegraph Company, Atlanta, Georgia; Frank B. Cook, Chicago, twelve stations; Home for the Jewish Friendless, Chicago, twelve stations; Sharpless Separator Company, Chicago, twelve stations; Western News Company, Chicago, twelve stations; W. H. Bunge, Chicago, six stations; Virginia Theater, Chicago, six stations; Jacob Press Sons, Chicago, seven stations; Dawson Bros., Chicago, eighteen stations; Geo. Nash Company, Chicago; B. A. Railton, Chicago, twelve stations; Jno. A. Wickum Company, Chicago, seven stations; Standard Gillet Light Company, Chicago, six stations; Monarch Brewing Company, Chicago, seven stations; C. S. Wolff & Son, Chicago, eight stations; Robinson Furnace Company, Chicago, seven stations; Whitaker Mfg. Company, Chicago, four stations; Fortune Brewing Company, Chicago, thirteen stations; F. L. Meckel, Chicago, eight stations; Acme Steel Company, Chicago, five stations; Paris Laundry Company, Chicago, five stations; Runzel-Lenz Electric Manufacturing Company, Chicago, six stations.

Its Bulletin No. 1 describes its system "E" in a very comprehensive manner and the company will send it to any interested party upon request, or quote on any size or style of system, either to install same complete or furnish the apparatus only.

PAGE & HILL COMPANY.

THE Page & Hill Company, Minneapolis, large cedar pole dealers, has made rapid advancements and is acquiring a fine reputation throughout the telephone fields. Owing to its complete and varied stock ranging from seven-

Southern extremity of yards, showing switching car.

foot fence posts to eight-foot poles and piling, and its modern equipment, a visit to the Minnesota transfer yard of Page & Hill Company is most interesting. Here antiquated methods of handling stock are entirely eliminated; steam and mechanical power being substituted to the greatest

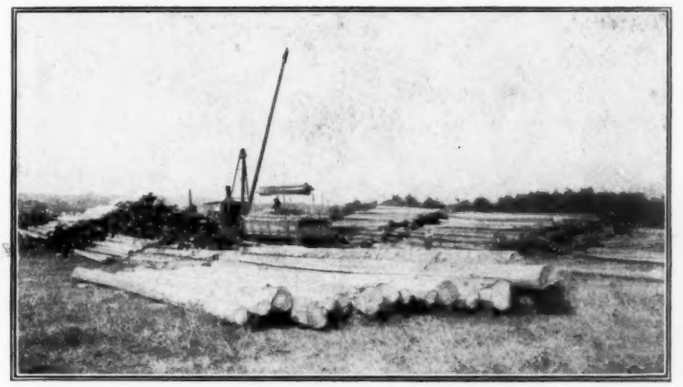
View of yard, showing conveyor.

possible extent. All stock is brought to this yard by rail. The poles are dropped from the cars, sorted for sizes, defective butts trimmed, crooked poles cut up, and the mercantile stock decked in immense piles, which is done with

Loading a double load of 8-inch fifties in Minnesota transfer yard.

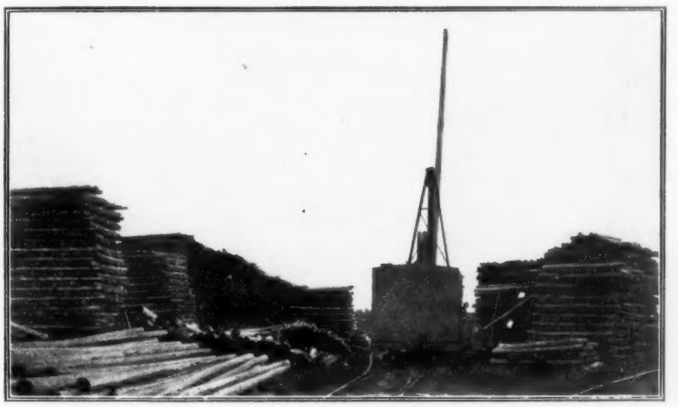
the steam loader, which handles the largest pole with the same ease as a seven-foot post. This steam loader was especially designed and constructed for the Page & Hill Company, and is shown in an accompanying illustration. It is guided by tracks, is self-propelling, and is used for switching cars, as well as for decking and loading.

This well-known concern maintains this yard in addition of its others in the district where its products are cut, on account of the great shipping facilities of Minnesota transfer and its available car supply. The company has one advantage in car supply not enjoyed by other industries at the same location, it is said, as it can use gondolas which arrive from the east in great profusion, coming loaded with



Loading 8-inch forties in yard of Page & Hill Company.

coal destined to the northwest, which coal is transferred to other equipment at Minnesota transfer. In several instances this firm has loaded and switched from its yard, cars loaded within two hours from the time of receiving the



Section of Minnesota transfer yard.

order, and loading orders the same day as received, it is claimed, is a very usual occurrence. The headquarters of this concern are in the Lumber Exchange, Minneapolis.

TORNQUIST'S INCREASED FACILITIES.

THE Tornquist Electrical Manufacturing Company has just located in its new plant at Moline, Illinois, and is now better prepared, it is said, to supply the telephone trade with its line of goods than ever before. Its new knife switches and "King of Protectors, No. 45," are claimed to be a sure protection against lightning for telephones and private telephone lines and are guaranteed in every respect. The new "King of Protectors" is so arranged as to entirely disconnect the line from the instrument, save the telephone and the fuse, and at the same time not interfere with the working of any other instrument on the same line. On the approach of a thunder storm, the switch lever is thrown open, which entirely disconnects the line from the instrument. When the switch lever is thus operated, injury to the instrument is said to be absolutely impossible. A new booklet fully describing this line of apparatus will be furnished to all interested parties upon request.

In putting up a forfeit to provide for the building of an Independent telephone line, the Swaine syndicate put down on the mayor's desk at Dallas, Texas, a sack of gold weighing thirty-six pounds, value $10,000.

TRADE NOTES.

GEORGE W. RODORMER is making a six weeks' trip through the central and eastern states for the American Electric Fuse Company.

F. F. FOWLE, consulting electrical and telephone engineer, announces that he has opened an office in the Marquette Building, Chicago.

THE BROOKFIELD GLASS COMPANY announces the removal of its general offices to the United States Express Building, New York, New York.

THE F. BISSELL COMPANY, Toledo, Ohio, has recently issued an interesting circular card in the form of a calendar, which will be sent upon request.

PASS & SEYMOUR, Solvay, New York, have recently issued a four-page circular, descriptive of their line of specialties, which will be sent to all who are interested upon request.

GEORGE R. BLACKBURN, Cleveland, Ohio, is issuing to the trade a series of artistic picture calendars, descriptive of the Blackburn ground clamp, which can be had upon application.

THE UNITED STATES CONDUIT COMPANY, of Toledo, O., has moved into its new factory at Monroe, Mich., and hopes to be in a position to take care of its friends better than ever before.

THE EDGECOMBE COMPANY, Cuyahoga Falls, Ohio, has recently issued a neat circular, descriptive of its insulator pins and brackets, which will be sent to all interested parties upon request.

THE NEW STATE TELEPHONE COMPANY, Sioux City, Iowa, has placed its contract covering pole requirements for the season's construction, with the Duluth Log Company, Duluth, Minnesota.

THE BLAKE SIGNAL & MANUFACTURING COMPANY, 246 Summer street, Boston, Massachusetts, has recently issued a four-page circular descriptive of its line of specialties, which will be sent upon request.

THE AMERICAN CONDUIT COMPANY, New York, has recently issued its bulletin No. 209. The company makes a specialty of underground construction, and is prepared to furnish any information upon request.

F. A. CROSELMIRE, formerly with Croselmire & Ackor Company, has severed his connections with its business and has taken the position of manager of the platinum department of the Roessler & Hasslacher Chemical Company, 100 William street, New York city.

THE WESTERN WIRE SALES COMPANY, Chicago, announces the retirement of J. Allen Haines and A. Conro Fiero. Richard Wick succeeds J. Allen Haines as president, and F. B. Keeler succeeds A. Conro Fiero as vice president. F. W. Pagel is sales manager.

THE FIBRE CONDUIT COMPANY, Orangeburg, New York, is sending out interesting information relating to "Linaduct," which will be forwarded on application. Linaduct is used extensively as a form and lining for concrete subways, for which purpose it is especially adapted. It is extremely light and is unexcelled, it is said, for rapid and inexpensive construction of concrete subways or laterals in residential districts.

THE STERLING ELECTRIC COMPANY, Lafayette, Indiana, is distributing to the trade a new circular which describes and illustrates some new designs of can top terminals and a way of mounting the protection. The company will be pleased to furnish it to all interested parties, with prices and samples upon request.

GEORGE M. MAYER, 1085 Old Colony Building, Chicago, Illinois, has recently been appointed agent for the Burnley Battery Manufacturing Company, of Northeast, Pennsylvania. He is handling a complete line of dry batteries and soldering paste which the company produces, and is making a specialty of handling orders from telephone companies.

THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, Rochester, New York, is circulating a unique advertising folder in the form of a four-page circular. It gives complete information about the Stromberg-Carlson No. 8 self-restoring gravity drop and 150-line unit type magneto switchboard. The folder is handsomely illustrated and will be forwarded on request.

ELLWOOD IVINS TUBE WORKS, makers of seamless steel tubing, mills and general office at Oak Lane Station, Philadelphia, have recently opened an office at 315 Chamber of Commerce Building, Chicago, to look after western business. The established New York office at 487 Broadway and English branch at 13 South Hampton street, London, will be continued, with the western office.

THE HAGSTROM BROTHERS MANUFACTURING COMPANY, Lindsborg, Kansas, has recently issued a circular descriptive of its porcelain tube and carbon cutter. This tool is so designed that pressure is applied to the tube equally at four points, thereby causing the tube to snap off at any point where pressure is applied. It needs no sharpening and is made in a convenient size to carry. The company will be pleased to quote prices upon request.

C. L. NORTON has severed his connection with the United States Telephone Company to accept a position with John A. Roebling's Sons Company. Mr. Norton assumes the duties of special agent, and will visit the various oil fields of the country to represent the company's product of wire rope. The experience acquired in the telephone field by Mr. Norton will be of great value to him in introducing the special work of which he has charge.

THE BLUFFTON ANCHOR COMPANY, Bluffton, Ohio, has prepared a special circular for the telephone trade, setting forth the merits of the Bluffton anchor. It is claimed that this anchor already has met with universal satisfaction wherever tried. It is durable, absolutely solid and can be quickly installed without a wrench or tool. The Bluffton Anchor Company will guarantee the quality of its anchors and is in a position to make prompt deliveries.

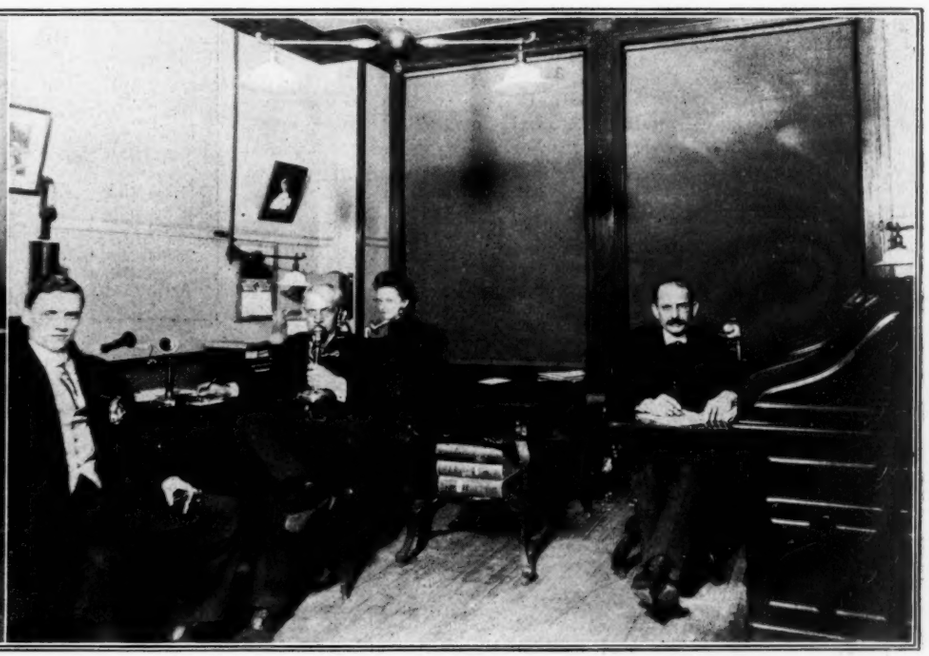
GEORGE R. BLACKBURN, Cleveland, Ohio, has moved to 412 Frankfort avenue, N. W., where he has secured a much larger space and improved facilities for manufacturing and supplying the increasing demand for the Blackburn ground clamps. He has recently received numerous in-

quiries about the new improved ground clamp, it is said, and is furnishing many new customers with it. The band of the clamp is made of nickeled copper with the perforations near together, while the plate for lead pipe has a large bearing surface so that it will not cut or damage the wall. Telephone companies that have ground connections to make, will be interested in a sample which will be sent upon request.

A USEFUL TELEPHONE SPECIALTY.

THE Staats Manufacturing Company, Chicago, Illinois, has an interesting device in the form of an automatic telephone receiver holder, which embodies many excellent features of construction. This clever contrivance gives the telephone user the free use of both hands as illustrated herewith while at the telephone, and which in no wise affects the use of the instrument electrically or otherwise. It saves time, gives comfort, promotes accuracy and rests the tired arm during long conversations. It is well proportioned, light, and especially adapted for enabling one to quote prices while handling catalogues, price lists, etc. It accomplishes a useful result and does away with the usual banging of the receiver on the desk. Representatives are wanted in every locality and attractive inducements are offered. Mr. Staats announces that his automatic holder has been adopted by many leading telephone companies; and he has prepared an interesting little circular descriptive of his device which will be mailed to all interested parties.

Taking dictation over the telephone.



Interior view of offices of Staats Manufacturing Company.

FRANK B. COOK SALES.

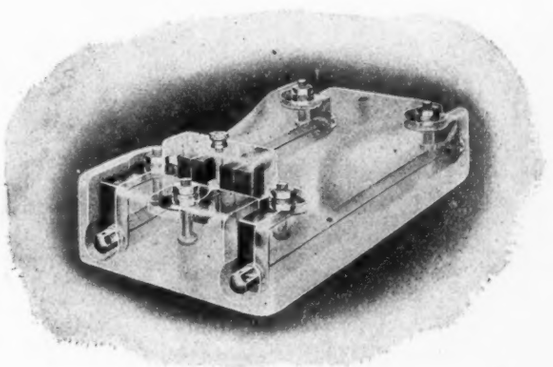
"BUSINESS is good," says Frank B. Cook of No. 242 West Lake street, Chicago, Illinois. "Things keep moving and we find quite a demand for our new porcelain terminals, both protected and unprotected. Just now we are making up another large order of these porcelain terminals for Omaha. We are also working on the complete inside and outside equipment for El Paso. The orders for wire joints and guy clamps still continue to come in."

The following are some of Mr. Cook's recent orders:

For main frame and protectors: Monarch Telephone Company, Chicago, 300 pairs; Ironton, Ohio, 160 pairs; Fairbury, Nebraska, 1,800 pairs, including intermediate; Aberdeen, South Dakota, 100 pairs; Holton Kansas, 600 pairs; Nelson, Nebraska, 400 pairs; Shelbina, Missouri, 400 pairs; Appleton, Wisconsin, 1,120 pairs; Mt. Gilead, Ohio, 600 pairs; Elkader, Iowa, 200 pairs; Berkeley, California, 4,000 pairs; Amarillo, Texas, 920 pairs; Billings, Montana, 1,300 pairs; Tulia, Texas, 200 pairs; Spokane, Washington, 3,700 pairs; Wilmington, Delaware, 500 pairs, intermediate. For pole cable terminals and junction boxes: Decatur, Illinois, 231 25 and 50-pair terminals; Lincoln, Nebraska, 30 10 and 20-pair terminals; Princeton, Indiana, 8 10 and 20-pair terminals; Milford, Nebraska, 16 25 and 50-pair terminals; Crete, Nebraska, 50 25 and 50-pair terminals; Omaha, Nebraska, 410 10 and 20-pair terminals; Webster City, Iowa, 30 25 and 50-pair terminals; Johnstown, Pennsylvania, 18 25 and 50-pair terminals. For sub-station protectors: Harrisburg, Pennsylvania, 500; Warrensburg, Missouri, 500; Sheboygan, Wisconsin, 100; Lincoln, Nebraska, 500; Sioux City, Iowa, 400.

STERLING APPROVED ARRESTER.

THE Sterling Electric Company of Lafayette, Indiana, has recently placed upon the market a new individual station arrester that meets with the approval of the fire underwriters in every respect. It is made up of a fuse and carbon, mounted in a heavy porcelain base, the porcelain base being 5¼ inches long by 3¾ inches wide and 1½



Sterling approved arrester.

inches deep. These sizes indicate that it is heavy enough to withstand a great deal of hard usage.

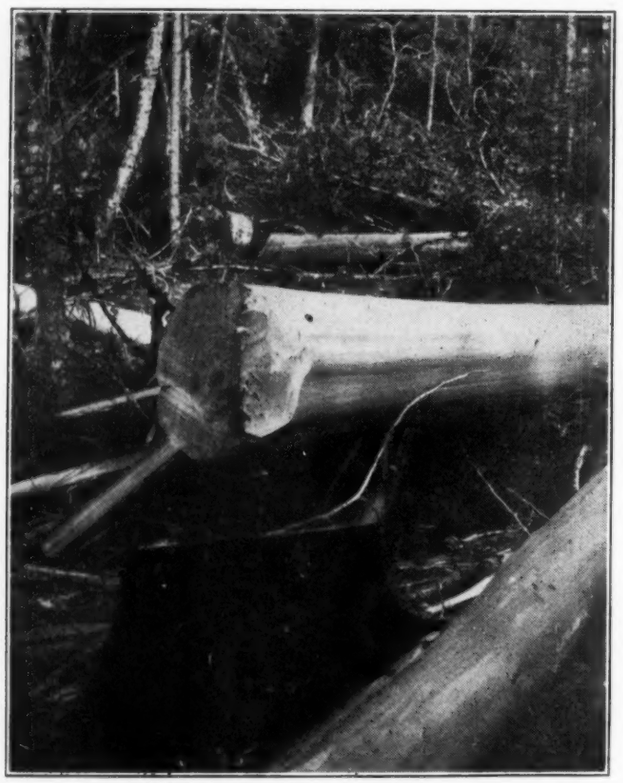
The porcelain base has two long tubes running the full length, through which the fuses are drawn, held in place at either end by brass clips. The fuse wire is drawn through a slot in the clip, over which is placed a washer and nut, making it possible to repair without difficulty, by simply using a needle about 6 inches long and drawing the fuse wire through. The carbons are mounted at one end of the block and have a pressed brass cap for a covering so that there is no chance of fire. The Sterling Electric Company is meeting with great success with this arrester.

MONARCH COMPANY SWITCHBOARD.

THE Monarch Telephone Manufacturing Company, Chicago, Ill., has just completed and shipped to the Interstate Telephone Company at Dyersville, Iowa, a 300 line magneto switchboard, having both bridging and series lines installed. It is equipped with special clearing out drops so arranged that it is impossible for a subscriber on a completed connection to ring by the switchboard even though it may be a low resistance ringer or a dead short on the line with which he is connected. The convenience of this arrangement can be appreciated by all who understand the difficulty sometimes experienced by a subscriber, connected through the switchboard with a series line, when trying to reach the operator with a disconnect signal. When a switchboard is equipped in this manner it is impossible to have any of the lines tied up.

W. C. CHURCH COMPANY CEDAR YARDS.

THE accompanying illustrations present two views of the very extensive cedar interests of the W. C. Church Lumber & Coal Company. This firm's specialty



Cedar operations on land of the W. C. Church Lumber and Coal Company.

is select white cedar poles, and its facilities have successfully withstood all the severe tests to which they have been subjected. The company owns its own cedar lands and does its own logging. Its headquarters are located in the heart of the consuming country. This enterprising concern maintains a number of yards and is well equipped to handle

Another view of cedar operations.

rush orders. How far reaching its business is may be seen from the fact that it has timber lands in Lammer's Spur, McCarty's Spur No. 2, Shook's River, Spur 144, Gemmell and Turtle River, all on the Minnesota and International Railway. The company's offices are in the Manhattan Building, Des Moines, Iowa, to which place inquiries regarding poles should be addressed.

CHICAGO HOSPITAL SIGNAL SYSTEM.

THE Stromberg-Carlson Telephone Manufacturing Company recently departed somewhat from the telephone field and constructed a set of four hospital lamp signal cabinets for the William P. Crockett Company, of Chicago, Illinois. These cabinets comprise the first of a series of installations, which the William P. Crockett Company is about to install in various hospitals throughout the city of Chicago.

The cabinets in this set are designed to meet the special requirements of a prominent Chicago hospital and are made up of birch with a white enamel finish. Its construction is such that all the apparatus may be readily inspected or repaired without interfering with the system's operation. Three of the cabinets are to be located in the nurses' wards. In each of these thirteen, lamp ended lines from the patients' wards are terminated. The remaining cabinet or monitor's cabinet is to be installed in the hospital's office, where it will be under the supervision of the main attendant.

In this cabinet the lamps in the former cabinets are multipled. All the lamps are mounted behind large red lamp caps. The thirteen line cabinets are each equipped with a bracket. Upon this is mounted a pilot lamp, which lights simultaneously with the line and monitor's lamps.

The Stromberg-Carlson Company is also manufacturing a large quantity of push buttons and push button plates, to be used in conjunction with the cabinets. These push button plates are to be distributed in the various wards and mounted on the wall near a patient's bed. On each of these plates is mounted a non-locking release button with a break contact. Also one end of a cord of sufficient length to be within reach of the patient, is terminated in the plate.

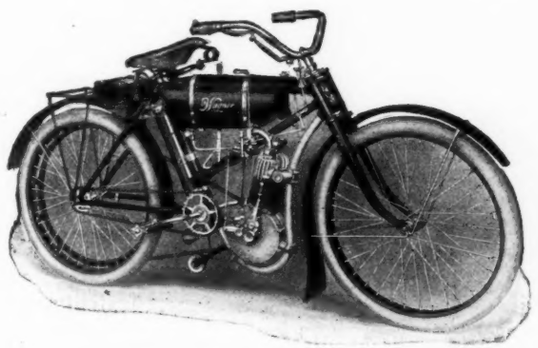
The other end being attached to a non-locking push button designed to make a contact. The contacts on these buttons are wired to their respective lamp cabinets. Here each of them controls a relay which closes a contact, thus lighting the lamp associated with the line.

The operation of the system is as follows: A patient desiring a nurse's attention signals her by pressing the button at the end of the cord. This lights a lamp in the cabinet to which the patient's line is terminated. It also lights the pilot and monitor's lamps. These lamps remain lighted until a nurse responding to the call arrives at the patient's room and pushes the release button.

Some of the system's prominent features are as follows: First, a patient can call a nurse with practically no exertion; second, having the release button out of the patient's reach, it eliminates all possibility of pressing the wrong button; third, complete supervision by the main attendant of the time taken by the nurses in responding to their respective calls.

THE 1908 MODEL WAGNER MOTORCYCLE.

SIMPLICITY of operation, strength, durability and easy riding are the features claimed for the 1908 Wagner motorcycle, manufactured by the Wagner Motorcycle Company, St. Paul, Minnesota. It is the result of over six years of practical experience, and represents, it is said, the highest development in motorcycle construction. The Wagner motorcycle, as herewith illustrated, is designed to give the greatest amount of power and speed with the least possible weight. The diamond loop frame and twin fork are distinct features in the frame construction, and the use of which gives the strength necessary in a machine of this kind, when under the severe strain to which it is subjected, when traveling at high speed over rough roads.



The 1908 model Wagner motorcycle.

Three bars coming from the head, form the diamond and motor loop. The use of the loop for support of motor places the latter low and forward out of the way of the rider. The twin fork has strength and durability, it is claimed and the complete success with which it has met during the time it has been on the market, has demonstrated conclusively that in design and construction it is absolutely perfect.

The Wagner Motorcycle Company recently removed to a modern fireproof building, equipped with up-to-date machinery, its business having developed so rapidly during the past few years. Its constant effort will be, it is claimed, to further the reputation which it now enjoys, as the manufacturers of a strictly high-grade machine. A catalogue fully descriptive of this motorcycle will be sent upon request.

UNIVERSAL PORCELAIN INSULATORS.

WITHIN the past few years, the use of twisted pair wire for telephone distribution, has increased considerably, due to its convenience in connection with crossarmless cable distribution. The Universal insulators, manufactured by the Universal Specialty Company, Terre Haute, Indiana, solve the problem, it is said, of a suitable insulator for twisted pair distribution, more completely than anything heretofore in use. They consist of only one piece, and being compact and neat, makes construction work look uniform and standardized. High and permanent insulation is assured, it is claimed, by having a groove for each wire, thereby avoiding all trouble, resulting from two wires being in one groove.

SOME STAR TELEPHONE SPECIALTIES.

THE Star Expansion Bolt Company, Bayonne, N. J., has recently issued a very attractive catalogue descriptive of its comprehensive line of expansion bolts, screw anchors, enameled bridle rings and drills.

Star expansion bolt.

Expansion bolts of every style in malleable iron, lead composition metal, brass and bronze are shown in any size from one-eighth inch to two-inch diameter so that every

Star expansion bolt.

possible requirement is anticipated. Star enameled bridle rings should need no introduction and are doubtless well known, as they have gained universal recognition, it is claimed, as the highest standard for quality.

Star expansion bolt.

The bridle ring as illustrated herewith shows the perfect mechanical construction which so readily permits of quickly and easily inserting and removing the wires, and as surely guards against its being displaced through any

Star bridle ring.

action of wind or strain. The ring is thoroughly protected by a triple coating of tough glass enamel which gives a smooth, glassy surface and which prevents any chafing of the wires.

A copy of this catalogue and samples may be secured upon mentioning TELEPHONY.

NEW WIRE ROPE FOR HOISTING.

IN THE use of wire rope for hoisting buckets and other similar loads from deep shafts, there has been a great deal of experimenting to get a wire rope that would not untwist while the load was being lifted, thus spinning the load around rapidly and causing the rope to unwind and scatter the load. Considerable research has resulted in the invention by Olaf Tangring, American Steel & Wire Company, Chicago, for which he has been granted a patent of a process whereby the rope is so peculiarly laid together in the making that it will not untwist, regardless of the length of rope that may be suspended.

A Fight With an Octopus

By Paul Latzke

The Story of the Bell Company's Rise to a Power that was second only to that of the Standard Oil Company—The Betrayal of Friends and Associates, The Sacrifice of Great National Characters and the Desperate Purpose of a Fight that was Carried Straight into the White House.

A FOREWORD.

[This story should appeal especially to those who have good, red American blood in their veins. It is the story of a magnificent fight that was won against overwhelming odds. It is the story of a smug coterie of "Boston gentlemen" of the immaculate type, put to flight by a few sturdy men out of the west. It is the story of a low, scheming campaign of greed, that was turned into a rout by a fine, sentimental, American citizenship. It is a story full of dramatic interest, not because of the manner of telling, which is simple and commonplace enough, but because of the facts it relates.

It is the story of at least one trust that was "busted." It is a story that, while dealing with the details of an industrial war, will interest even the women, for it is full of good, clean, honest fighting, of the deeds of men who stood shoulder to shoulder under the Stars and Stripes, and, in the name of American freedom and independence, lined up against the most complete and relentless and successful monopoly of the times—and beat it to a pulp. It is a poor sort either of man or woman who cannot find somewhere in the record of these fighters the story of a deed that will stir the pulse.—THE AUTHOR.]

CHAPTER VIII.

WHAT COMPETITION HAS ACCOMPLISHED.

WHEN competition began, in 1894, there was literally not a farmhouse in the country that was connected with a telephone exchange; and, perhaps, it is no exaggeration to say that there was not a farmhouse that had a telephone. The Bell company declined absolutely to construct or establish farmers' exchanges or to build farmers' lines. The best that a farmer who desired connection with the nearest town could do was to rent two instruments at $100 a year and build and maintain his own line. When a farmer wanted the telephone people to build a line out to his place, he was compelled to guarantee tolls amounting to at least $500 a year. Naturally, under such conditions, the farmer was cut off from telephone communication, and that meant from the world, as he understands it to-day. Now a farmer can buy a telephone outright for from five dollars to sixteen dollars, according to quality, and he and his neighbors can build their own line as low as seventy-five dollars a mile.

The report of the Indiana Independent Telephone Association shows that there are, in that state alone, 50,000 farmers connected with the exchanges. In Iowa there are probably twice as many. In Michigan, Wisconsin, Illinois, and others of the western states, the numbers are in proportion. Approximately there are now one million farmers in this country who have telephones installed. Quite a number of these are on Bell lines, for, under the stimulus of competition, the Bell people have been compelled to secure farmers' connections, in order to hold any business at all in some of the smaller towns and cities. Very few of these farmers pay more than eighteen dollars a year for their service; the maximum is about twenty-four dollars a year. It has been stated that the farmers and ranchmen are profiting to the extent of at least $50,000,000 a year, through the advantages the telephone gives in keeping them in close touch with the markets and in saving useless labor and wear and tear.

The manner in which one of the farmers' lines out of a Minnesota town was inaugurated furnishes a fair illustration of the point I make here. On the route of this line, as it exists at present, there was living a wealthy farmer who annually raised a large crop of potatoes. He would hold his crop in stock awaiting a specific order, and then it was a question of getting to market in large quantities in quick time. To aid him in his hauling he contracted for the services of another farmer, who lived twelve miles away. The only way, however, that he could get this man when he wanted him was to drive out after him. This involved about a day's time and the use of a team in going and coming, besides delaying the hauling a day. After many years of this waste a co-operative line was constructed. On this there are now twenty-six subscribers, who have connections with the town exchange, and who, among them, easily save $1,000 a year in economizing on the time of their hired hands and the wear of equipment.

Rev. Francis Hope, of Dixon, California, described recently the installation of a "barbed-wire line" between the towns of Dixon and Winters, a distance of eighteen miles. The Sunset (Bell) company had been repeatedly applied to for service, by the farmers and ranchmen in the surrounding country, but the managers always declined to grant it. When the patents expired, the people took the matter into their own hands and used their barbed-wire fences. The idea spread through California and into several other states. The result in saving time and money was so gratifying that the farmers gradually substituted a higher class of construction for the barbed-wire lines, which necessarily worked only part of the time. Now the Sunset company is as eager for the farmers' patronage in California as it formerly was arbitrary; but the farmers, as a general rule, are sticking closely to the Independents.

Some time ago the village of Mountain, North Dakota, was put in touch with the rest of the world, for the first time, by the construction of a telephone line from the town of Cavalier, fifteen miles away. Just after the line had been connected, a boy of the village attempted to climb one of the new poles and, falling, broke his leg. It had always been the custom, when a doctor was wanted in Mountain, to send over fifteen miles of country road to Cavalier. This custom was followed, as usual, and it was not until the doctor had returned to Cavalier that it occurred to anyone that they might have used the telephone and saved the expense of sending a man and a team on an all-day's drive.

This incident caused considerable comment in the daily press because of its "amusing" side. To my mind, its pathetic side is more apparent, the side that kept this village, for so many years, through the narrowness of the telephone trust, without knowledge or use of a labor-saving utility that should have been at its service for a quarter of a century.

But the economic consideration of the telephone question, important as it is, does not, by any means, represent everything to the farmer. It has wrought for him a social, as well as an economic, revolution. The advent of the Independents and their popular rates have put an end forever to the heartbreaking, demoralizing loneliness of farm and ranch life. Much has been written of the influence that rural free delivery has had on the life of the farmer; but, beside the influence of the telephone in this direction, rural free delivery is almost inconsequential.

When the Independent companies first began to come together in conventions to exchange experiences, one fact was always commented upon with great curiosity by the managers of town or city plants. This was that they invariably met with failure in their endeavors to induce farmers to put in what are known as "lockout" devices, by means of which every telephone on a party line becomes practically a private wire. In cities, the party line is considered a great nuisance, because there is no privacy in conversation. Naturally, the managers of plants figured that this objection prevailed in the country also; but, almost without exception, they found that one of the great attractions to the farmer was that his telephone *did* ring every time the other sixteen or twenty people on the line rang up, and that he could hear or be overheard in conversation. It was a practical demonstration of the social hunger the farmer has endured for centuries, and which is now ended, thanks to the arrival of telephone competition.

Several years ago an editor in a small Illinois town conceived the notion of strengthening his subscription list and, incidentally, making a little money on the side by running out farmers' telephone lines into the surrounding territory. Anywhere from fifteen to thirty telephones were put on one line. The farmers paid one dollar a month for the service, and, in addition to having the free use of the line for telephoning among themselves, and to the merchants of the town, they had a greater boon still. The editor, as an inducement to subscribers, inaugurated a "daily telephone news service." Every night, when he received the latest Chicago newspapers, he cut out the principal headlines, and summarized the leading news items. Then, at a certain hour, in response to a given signal, all the farmers on his lines picked up their receivers and the editor read to them the full news of the day. In this way families living twenty miles from the nearest railroad or telegraph station had the news of the world as quickly as dwellers in the great cities. The idea spread until now hundreds of country telephone companies are giving their farmer subscribers daily news service.

This and other examples make clear what the telephone monopoly must have cost the farmer during the eighteen years that it existed. What it cost the small business man is made equally clear by an incident that occurred during a "telephone strike," in Rochester, New York, in 1886.

CHAPTER IX.

THE TERRIBLE COST OF MONOPOLY.

The people of Rochester were aroused to action by a proposed change in telephone rates by the monopoly that followed the Bell-Western Union consolidation. There were protests, mass meetings, round-robins, and, finally, concerted action. At noon, on November 20, 1886, practically every telephone receiver in the city was hung up, and, for eighteen months, when the telephone people finally gave in, there was no telephone service in the city. It was an "uprising of the people." The signal for the uprising smacked strongly of the days of '76. Every whistle in the city was blown at the noon hour on the eventful day. Every bell was rung, and criers and messengers were sent out proclaiming the strike. The subscribers draped their telephones in mourning and decorated them with all sorts of legends. Altogether, the strike was full of incident and patriotic action. One of the smaller Rochester grocery stores put up this sign in the show window:

> "Like all other good citizens we have put our telephone out of business. But our customers will not be inconvenienced, because we have arranged to put on an extra call wagon to take the orders that used to come by telephone."

"An extra call wagon" meant the wages of a boy at $240 a year, the keep of a horse at $240 a year, the investment for horse and wagon, and at least $100 a year for wear and tear. Here was an item of over $600 a year imposed upon one small merchant, that was saved by the use of the telephone.

When it is considered that the business methods of the Bell company deprived hundreds of thousands of small merchants, throughout the country, of the use of the telephone during eighteen months it is easy to realize the tremendous economic damage inflicted in this field by the trust. True, it may be stated that there was no reason why every small merchant in the land should not have had a telephone, if he was willing to pay the price and accept the conditions laid down. But that is begging the question. The price asked in every case was exorbitant, and the conditions arbitrary. It was because of this exorbitant price and arbitrary treatment that the spirit of resentment was bred throughout the land that prompted the people to take the telephone business into their own hands as soon as the law would let them.

About 1891, there were many complaints of poor service throughout the country, and experiments showed that the complaints were due principally to improper handling of the Blake transmitters then in common use. A young man, named Lyon, had shown himself very apt in the Chicago laboratory of the Bell manufacturing company, in readjusting the Blake transmitters and getting excellent service out of them. He was, accordingly, sent on to New York, where the complaints were most numerous, and, under his instruction, a company of experts was organized to readjust all the instruments. The service complaints ceased wherever the experts were sent out. While they were yet only fairly startd on their work, the present form of so-called "long distance" or solid-back transmitter was perfected by Anthony C. White, one of the Bell engineers. Immediately, the Bell people saw another opportunity to give the public a twist. They began to push "long-distance equipment." This consisted of the substitution of the White for the Blake transmitter, and the installation of a double copper wire for the ordinary iron wire. Altogether, the change of equipment involved an outlay not exceeding twenty-five dollars for each subscriber. But the public was led to believe that it meant a great investment for all sorts of mysterious items. In New York City, for example, "long-distance equipment" was charged for at the rate of $100 a year over "ordinary equipment," or $220 instead of $120. In spite of this large increase, quite a number of the big New York business houses put in the "long distance." The majority of subscribers, however, were quite content with the Blake equipment,—"especially," as many of the Bell's patrons were indiscreet enough to say, "since your adjusters came around and fixed our transmitters."

Here was a situation to make the Bell managers gnash their teeth. The work which they had foolishly set Lyon and his men to doing now promised to keep thousands from falling into the alluring "long-distance" trap.

The first thing done was to discharge the astonished Mr.

Lyon, and transfer his helpers to another department. Thereafter, the complaints of poor service with the Blakes, instead of being amended by a readjustment of the transmitters, were met with the suggestion of installing "long-distance" equipment. This, and this alone, the grumbling subscribers were told, could bring relief. Otherwise the company could do nothing for them. Naturally, this canvass had its effect, and the $220 service was subscribed for at a rate that would have satisfied souls less greedy. But, after the first flush of success and satisfaction, it was decided that the new rate must be forced into general use, and the old rate of $120 entirely abrogated, through the medium of the "long-distance" scheme.

After consultation with the officers of the parent company in Boston, as to ways and means, a "special conference" of heads of departments was called. As a result of this conference, it was decided that no contracts would be renewed or accepted except for the "long-distance" equipment. If the people of New York were so foolish as not to want the best,—why, the best must be forced on them at an increase of $100 a year to the Bell treasury. The point was clearly conceded that this meant the falling away of many subscribers who could not or would not pay the big increase. But the old policy, "small service and high rates," was controlling, and the public might go hang. There was a terrible howl from this same public when the ultimatum was presented, but it could "take it or leave it," and that was all the answer the Bell people would make.

Incidents like these could be multiplied indefinitely. They were occurring all the time, in every part of the Union where the telephone was in service. The "long-distance" game is still being worked, in some communities not protected by competition, in spite of the fact that no other sort of equipment is now put out by any company that understands its business.

Nor is this the only method by which the public is being jockeyed at non-competitive points. In New York City the trust was recently threatened with a legislative investigation as the result of an organized outcry against its exorbitant rates. The protest was led by the New York Herald, and for a time, it actually looked as if the legislature might really do something,—a serious chance, in view of the queer habit legislative investigation committees in the Empire state have developed lately of actually going to the bottom of things. To meet this alarming contingency, the telephone company made a "voluntary cut in rates." The public rejoiced, and is still rejoicing. But if the good people will scrutinize their new rates a little more closely, they will find that the "cut" is really more on the surface than down below, where the money is paid. The reduction, such as it is, applies only to the fixed yearly rental for instruments and other equipment. As even under this reduced rental the subscriber is still taxed each year with a sum representing the total cost of this equipment, the generosity of the company is not very sorely taxed here. The message rate, the real source of cost to the subscriber, is left as high as ever, and the "excess" rate was actually raised one cent a message under the "notice of reduction" sent by this generous company to my office. We had a "flat" rate contract based on two thousand seven hundred messages a year. On this I was granted, under the "voluntary reduction," a cut of twenty-seven dollars a year. But the same document that provided for this "cut" provided also for an increased rate of six cents for each additional message over the two thousand, seven hundred, instead of five cents, as was provided in the old contract. Therefore, if we had in our office an excess during the year of two thousand, seven hundred messages, we would, in the end, be paying exactly what we paid before. Clever, isn't it?

And yet the Merchants' Association, of New York, a most dignified body, has issued a solemn report, expressing its unqualified satisfaction with the telephone situation as it now stands in the metropolis, and declaring that a competing system is not to be encouraged for a moment. Small wonder the telephone company has had copies of this fine report printed in handsome form for general distribution. It reads like a brief for the telephone people; yet it was made in all honesty by the most public spirited and influential body in the city, after months of labor and research. The trouble was simply that the good merchants didn't know. They were led by the nose by the smooth Bell gentlemen, as many another merchants' association has been led before them in other cities. After a while they will learn that they have been tricked, as these other associations learned. And then there will be real trouble, and a demand for an Independent system. The association members will see the absurdity—not to say dishonesty—of a proposition which, put in terms that a merchant can understands, comes to this:

"We have been charging you thirty dollars for one thousand yards of calico, under a contract that you will take at least one thousand yards a year, and for each yard in excess of one thousand, we have been charging you two cents. Now we propose to grant you a voluntary reduction by charging only twenty dollars for the first one thousand yards, but we will have to ask you to pay us three cents for each additional yard, instead of two, as heretofore."

Wouldn't that make a Chinese mandarin laugh? Yet it is thoroughly characteristic of the Bell system. Such methods have always been characteristic of its system. It was the application of these methods from the start that prepared the ground so admirably for that "uprising of the people" which was deemed inconceivable, but which came, nevertheless, to pass, sweeping out the Bell company's monopoly in the greater part of the land. This "uprising" was truly extraordinary, in view of the conditions the Independents had to meet.

[The continuation of Mr. Latzke's telephone story will be found in the May TELEPHONY. The next installment will be very interesting. The complete story may be had in book form at 25 cents per copy. Address TELEPHONY, Manhattan building, Chicago.]

BUSINESS INCREASING.

THE Western Telephone Manufacturing Company, Chicago, reports that it has received more orders for switchboards during the month of February than were received in any one month during the past two years. With these switchboard orders, also, were orders for telephones which have compelled the factory to work overtime during February to keep up with the increase in business. Manifestly, the operating companies are pleased with the Western Telephone Manufacturing Company's type "F" drop and "Economist" telephones, these two pieces of apparatus composing the bulk of the month's increase in business. The firm would be pleased to have parties interested in telephone apparatus, write for its specifications and prices on switchboards and telephones.

A UNIQUE INCIDENT.

THE Michigan Electric Specialty Company, Muskegon, Michigan, reports that during a recent sleet storm in Ohio a 5,600-volt arc circuit became crossed with two farm lines partly equipped with Vac—M arresters and one city line not so equipped. The city line, equipped with old style arresters, was badly burned out, while the farm lines remained uninjured. One of the farmers on the line, it is said, noticing the light in the arrester on his telephone, extinguished the lamp he had burning and read his paper for about fifteen minutes by the light coming from the arrester.

Telephoning over power wires has been done with some success in Vienna. In the United States telephoning from a moving car over the trolley wire has been made the subject of considerable experimenting.